E HNOLOGY DEPT.

Grinding and Finishing

november, 1957

In this issue:

5th European Machine Tool Fair
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—see page 28

G-E Announces Availability of Man-Made Diamonds
—see page 35

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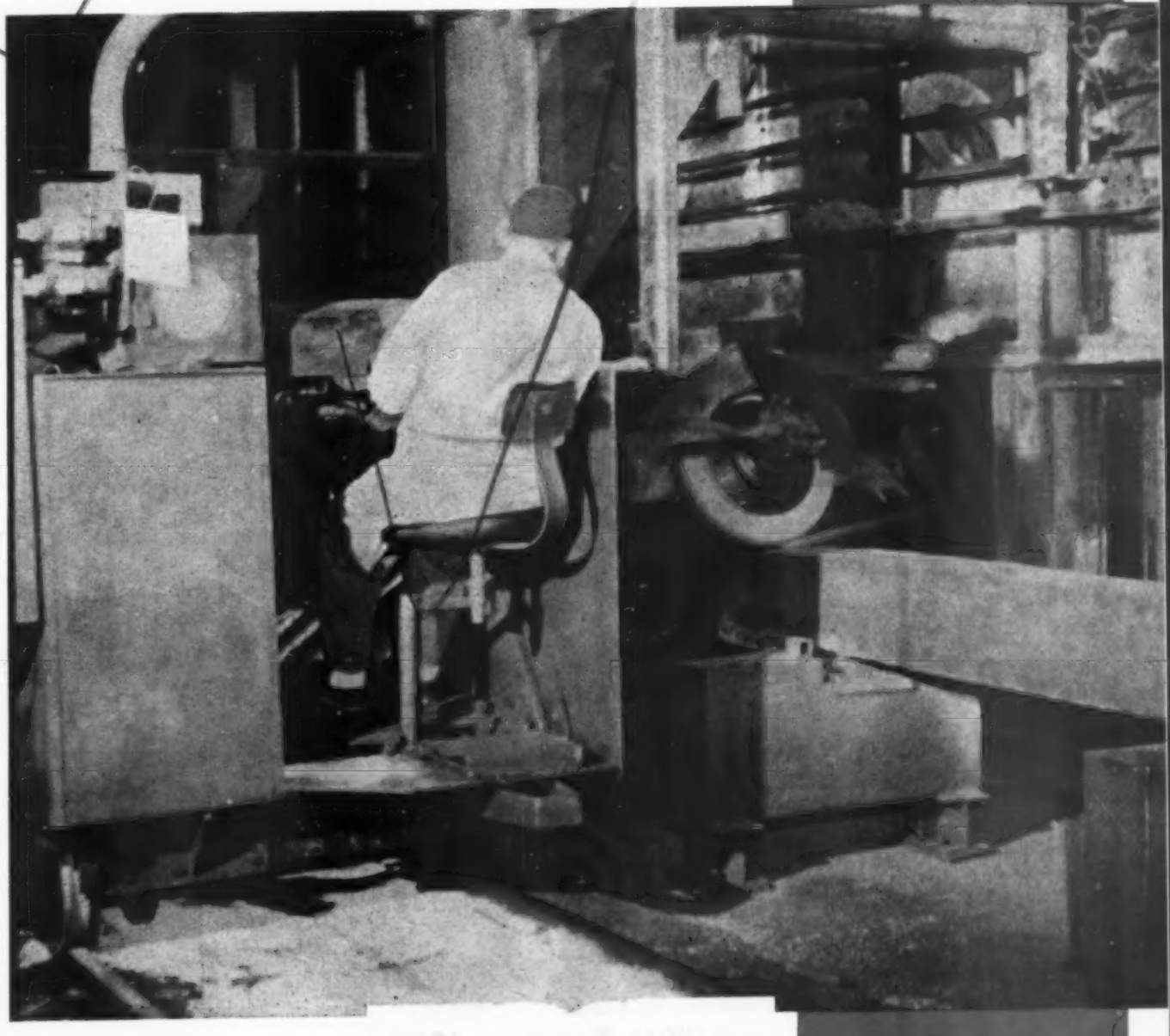
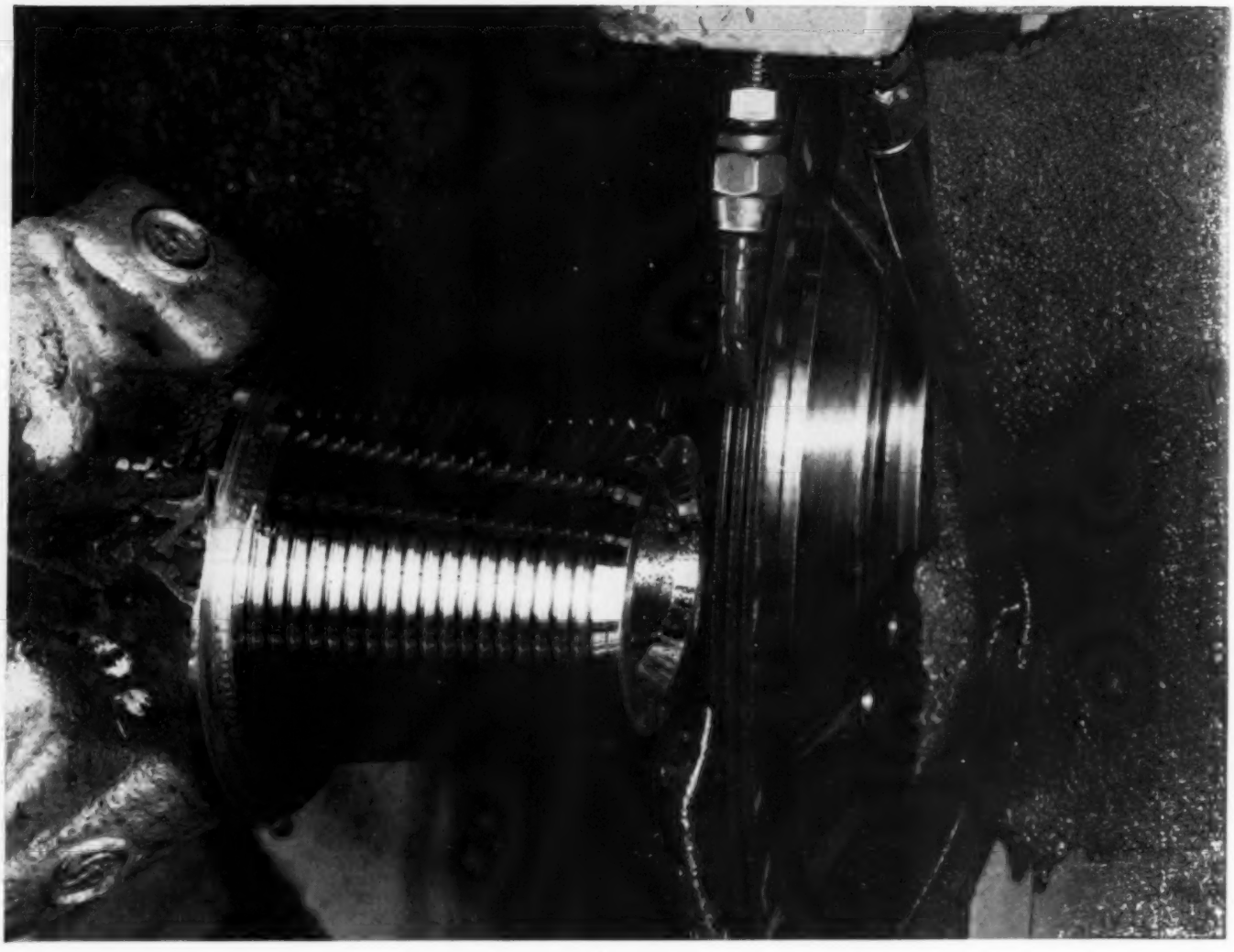
DETROIT



Babcock & Wilcox and Crucible Steel Use Automatic Billet Grinding
—see page 20

a hitchcock publication



Accurate threads, fine finish, clean wheels with Texaco

This 24" multi-rib diamond dress wheel is used to thread rock bits of tough AISI 4620 alloy steel on a Jones & Lamson Thread Grinder. It's a one-pass operation at 1910 rpm—grinding 5 threads per inch—4½ API. And they *have* to be accurate.

A well known tool company (name on request), uses *Texaco Grindtex Oil 411* exclusively on this job. For over four years now, *Texaco Grindtex* has given them excellent wheel performance—accurate threads—fine finish—long oil life, and low operating costs.

Reasons? *Texaco Grindtex Oil 411* keeps grinding dirt from loading wheels. It's especially suitable for grinding hardened steels—effectively prevents surface discoloration or burning.

There is a complete line of *Texaco Cutting, Grinding and Soluble Oils* to help make all your machining operations more efficient, and reduce costs. A Texaco Lubrication Engineer will be glad to help you select the proper ones. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

TEXACO

TEXACO CUTTING, GRINDING, SOLUBLE AND HYDRAULIC OILS

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Contents • Nov. 1957

#7

grinding and finishing

the magazine of abrasive metalworking operations

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BPA

FEATURE ARTICLES

"We Went to the Messe" 23

An eye witness report of the Fifth European Machine Tool Exhibit at the 10-Day Hannover Messegelande. Here 995 exhibitors had on display, most of them under power, some 4,000 machines. By V. C. Hogren.

Switch from Musclepower to Horsepower with Automatic Billet Grinding 28

Two case histories: Babcock & Wilcox and Crucible Steel. Wheel cost per pound of metal removed has been reduced approximately 60%. By Darrel Ward.

100,000 Carats of Man-Made Diamonds 35

This is the announcement made by General Electric on the production total made to date in its pilot plant in Detroit. By the end of the year a substantial quantity will be in use.

Efficient Tool Sharpening Expedites Tricky Drilling Job 38

At the Burroughs Plymouth Plant it was discovered that grinding eliminates burrs, eliminates delay of sharpening outside, and cuts costs almost in half. By William A. Johnson.

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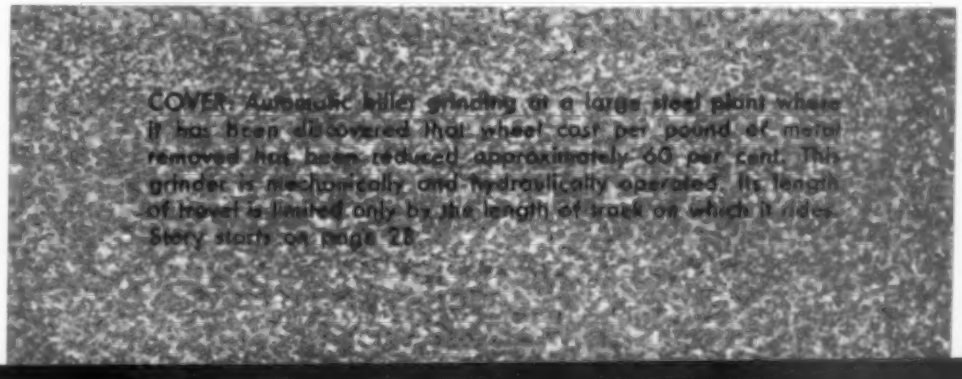
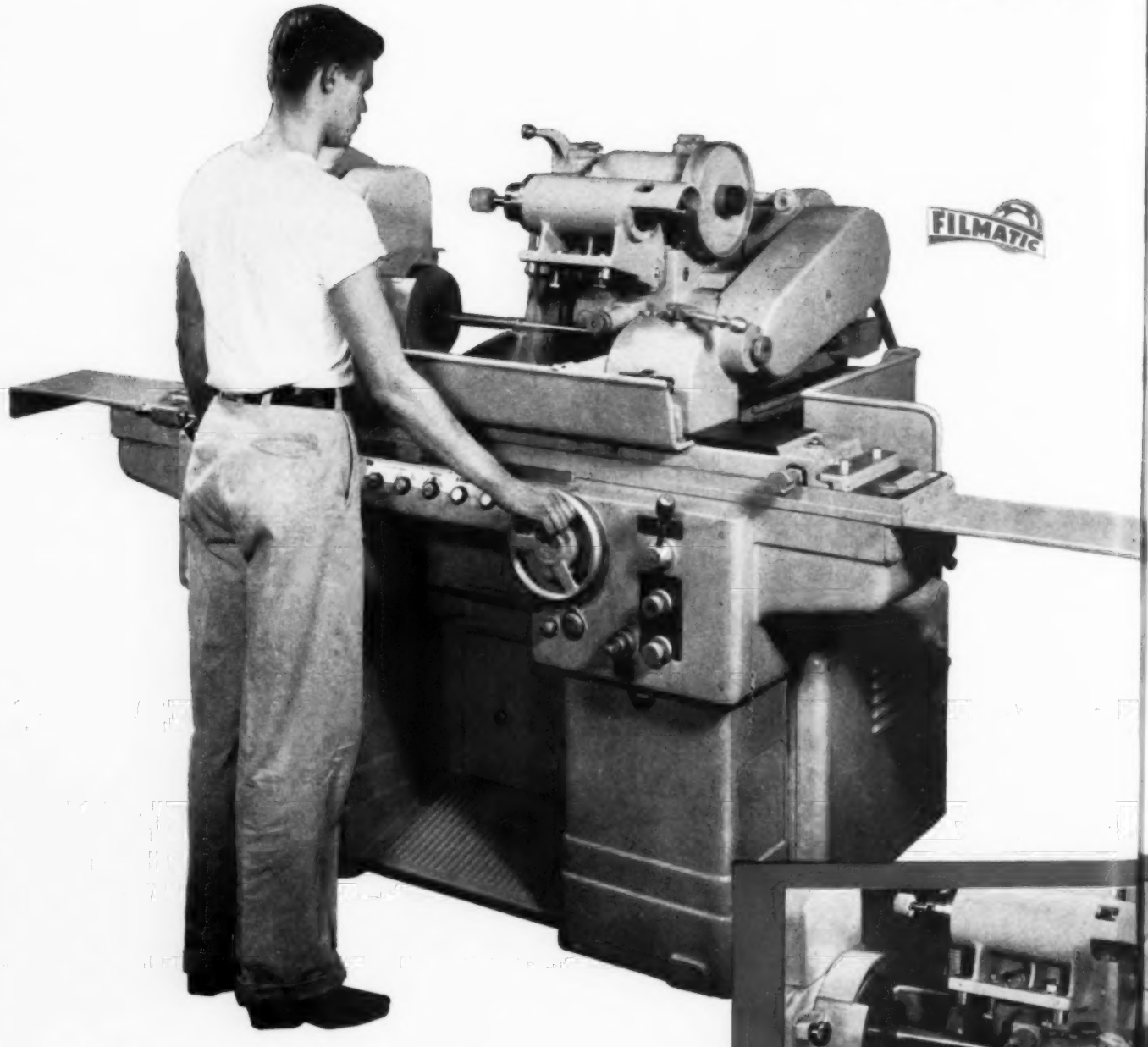


COVER: Automatic billet grinding at a large steel plant where it has been discovered that wheel cost per pound of metal removed has been reduced approximately 60 per cent. This grinder is mechanically and hydraulically operated. Its length of travel is limited only by the length of track on which it rides. Story starts on page 28

This CINCINNATI

Precision



Grinding a slender shaft . . . one of many types of precision toolroom and production grinding operations performed on CINCINNATI FILMATIC 10" Universal Grinding Machines.

Traverse grinding a taper. Amount of taper ground on these machines can be as much as 4½" per foot.

CINCINNATI

CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • ROLL GRINDING MACHINES • SURFACE

UNIVERSAL

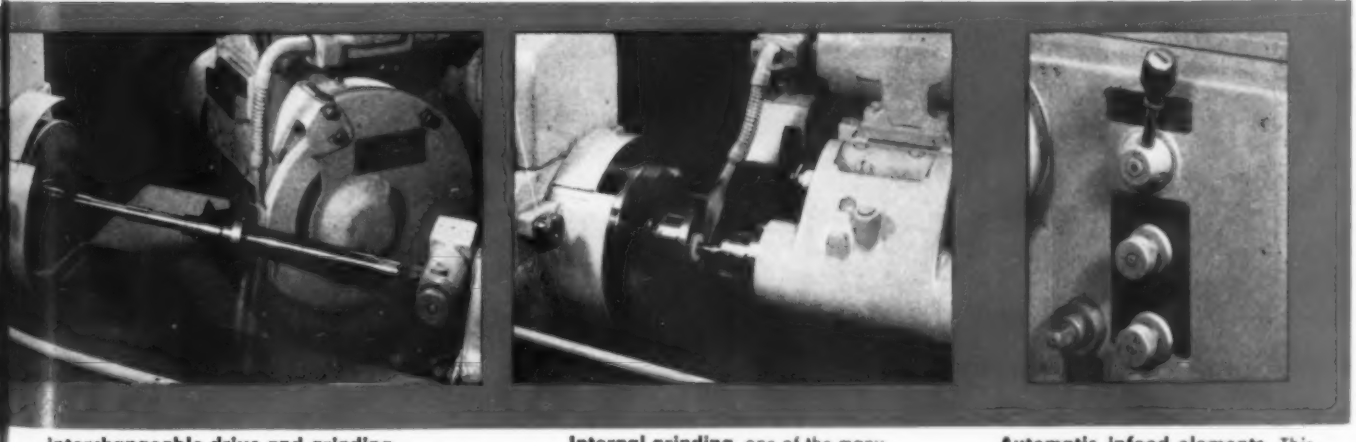
Grinds One Part or Hundreds

Look at your universal grinders from this viewpoint: when the need arises, can they handle big quantities at the low cost expected of high production equipment? It's routine work for the CINCINNATI® FILMATIC 10" Universal illustrated here. In addition to an unusual degree of versatility, this machine is equipped for automatic infeed grinding. For this type of work, a movement of one hand initiates the complete grinding cycle . . . rapid advance wheel to work, grind, tarry, return, and start and stop headstock rotation and coolant flow. ¶ The 10" Universal's extra measure of power is a big factor in both toolroom and production work. Consider these items compared to other machines in its class:

Largest grinding wheel: 12" diam. x 1½" face
Most powerful wheelhead motor: 2 hp
50% larger headstock motor
Exclusive FILMATIC grinding wheel spindle bearings

In addition to all these production advantages, the CINCINNATI FILMATIC is a true universal. Wheelhead swivels 180° and 220°, upper and lower, respectively; headstock swivels 180°; headstock speeds are infinitely variable 60 to 600 rpm. Want more information? Sweet's Machine Tool File contains brief specs. Complete data in catalog No. G-577-5.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO



Interchangeable drive and grinding wheel, for grinding the right-hand face of shoulders. An excellent finish is produced with this equipment.

Internal grinding, one of the many operations performed at low, low cost on CINCINNATI FILMATIC 10" Universal Grinding Machines.

Automatic infeed elements. This type of equipment is built-in at the factory, does not restrict versatility of the machine in any way.

GRINDING MACHINES • CHUCKING GRINDERS • MICRO-CENTRIC GRINDING MACHINES • CENTERLESS LAPPING MACHINES

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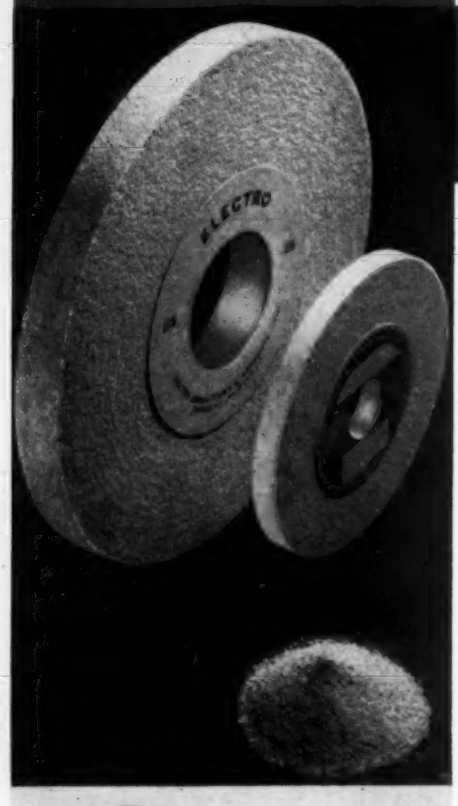
NEW 8-A PRECISION and TOOL ROOM GRINDING WHEELS

Electro TRADE MARK SINCE 1919

TESTS SHOW THEY ARE 8 WAYS BETTER!



CHECK FOR THE PROPERTY YOU WOULD LIKE...

- ☐ 1 Premium grinding action from non-premium priced wheels.
- ☐ 2 Exact duplication, one wheel to the next.
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8-A WHEELS have been thoroughly proven on a wide variety of applications. We urge you to √ check for 8A uses in your plant.

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Letters to the Editor

Hand Applied Dressers

I have just read with interest the feature article entitled "How to get the most from Hand-Applied Dressers," appearing on pages 52 through 54 of the September issue.

I would like to have additional copies of this article for distribution to other plant personnel and therefore wonder if it would be possible for you to send me two reprints or two additional copies of this issue.

Clarence White, President
Oil Well Mfg. Co.,
Los Angeles, Calif.

Barrel Finishing

I have read "Automatic Barrel Finishing" at I.B.M. by R. S. McFall in the May issue, page 41, with considerable interest, as it dwells in great length upon procedures in barrel tumbling.

Needless to say, my curiosity has been aroused to the point where I would like the entire series by Mr. McFall to add to our reference library on this particular type of metal finishing, and wish to know whether or not there is any charge for reprints or tear sheets.

Eugene Pawley
Time Study and Methods Dept.
Allis-Chalmers Mfg. Co.
Boston, Mass.

. . . I recently scanned through an old edition of **Grinding & Finishing** that has been collecting dust in my files. I am very interested in an article on barrel finishing that appeared in your January 1956 edition. This article was the fifth in a series of five articles and referred to four previous articles, appearing in September, October, November and December. Naturally these would be in 1955.

Is it at all possible that I may be able to obtain copies of the four editions listed above?

Also, if possible, may I be privileged to be placed on your mailing list for future editions of your fine magazine?

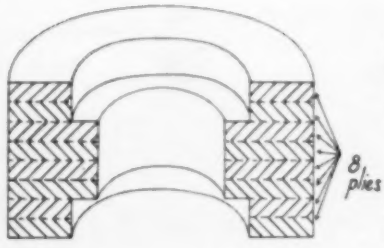
Richard A. Togni
Work Standards
New Process Gear Div.
Chrysler Corporation
Syracuse, N. Y.

(Continued on page 8)

VULCANITE REGULATING WHEEL

3 Molding Methods make "U.S." Wheels the pace-setters

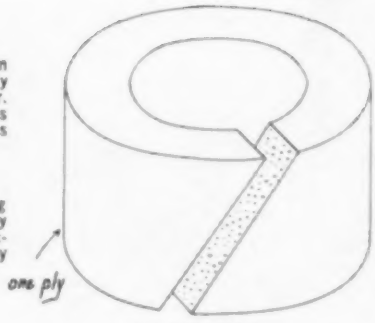
Unmatched Uniformity



ORDINARY WHEEL

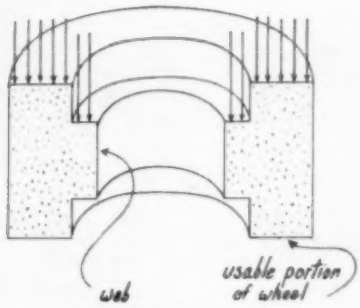
In ordinary construction (multiple ply), plies vary slightly from each other. Very often this causes variation in hardness across face of wheel.

But in U.S. Regulating Wheel, the one-ply "wrap-around" construction assures uniformity across wheel face.



"U. S." WHEEL

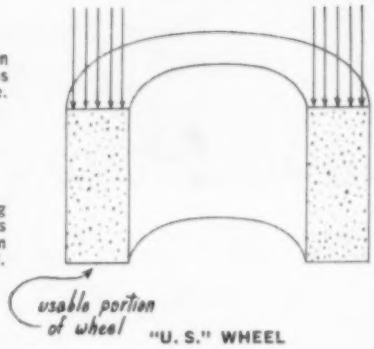
Full Molding Pressure



ORDINARY WHEEL

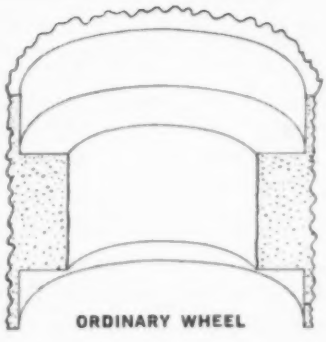
The integral web in ordinary wheel absorbs part of molding force.

In U. S. Regulating Wheel, there is always full molding pressure on usable portion of wheel.



"U. S." WHEEL

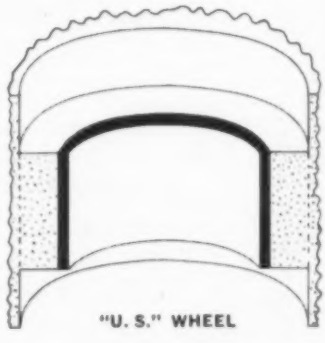
Arbor Clearance of .001"



ORDINARY WHEEL

Most methods of arbor hole preparation do not permit a closer clearance than .005".

"U. S." method involves casting a material. Its cast smoothness and natural lubricity permit the closer arbor clearance of .001". Result: far less chance of the wheel shifting under high grinding pressure—the wheel can be mounted and demounted very easily.



"U. S." WHEEL

Years of careful study of customers' needs resulted in creation of this U.S. Vulcanite Regulating Wheel. It has high resistance to wear, and precisely the right degree of traction and cushion. Less infeed is required, enabling the operator to hold size better. *Yet, U. S. Vulcanite Regulating Wheels cost no more than ordinary wheels.*

Write to Grinding Wheel Sales Department, United States Rubber, 4300 New Haven Avenue, Ft. Wayne 4, Indiana.

Mechanical Goods Division

United States Rubber

SEE THINGS YOU NEVER SAW BEFORE. VISIT U. S. RUBBER'S NEW EXHIBIT HALL, ROCKEFELLER CENTER, N. Y.

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Working with foreman Bill Todd (right) of Whitin Machine Works, Whitinsville, Mass., Bay State distributor, Vic Ericson (left) of Johnson deVou, Worcester, Mass., helped cut Whitin's grinding costs thousands of dollars per year.

They made 1 wheel do the work of 12

Centerless grinders at Whitin Machine Works were handling parts ⅛" to 5" diameter in bronze, brass, aluminum, cast iron, Meehanite and various steels. Short runs averaged between 3 and 300 pieces. With a dozen different wheels in use, the opportunities for savings on wheel changes alone are tremendous.

Department foreman Bill Todd wanted to simplify. He was looking for *a single all-purpose wheel that would eliminate all wheel changes due to varying job requirements.*

For a while it looked as though he was asking the impossible. But Bay State distributor Vic Erickson went to work with the sales engineering staff at Westboro and came up with a solution . . . a single wheel that handles the entire range of sizes and metals with only one dressing an hour. Finishes average #16RMS . . . go as fine as #2 with special care.

Whatever your company's abrasive problems may be, you'll find Bay State representatives ready to help and competent to work out practical solutions.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Mass.
Branch Offices and Warehouses: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh.
Distributors: All principal cities. Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ontario

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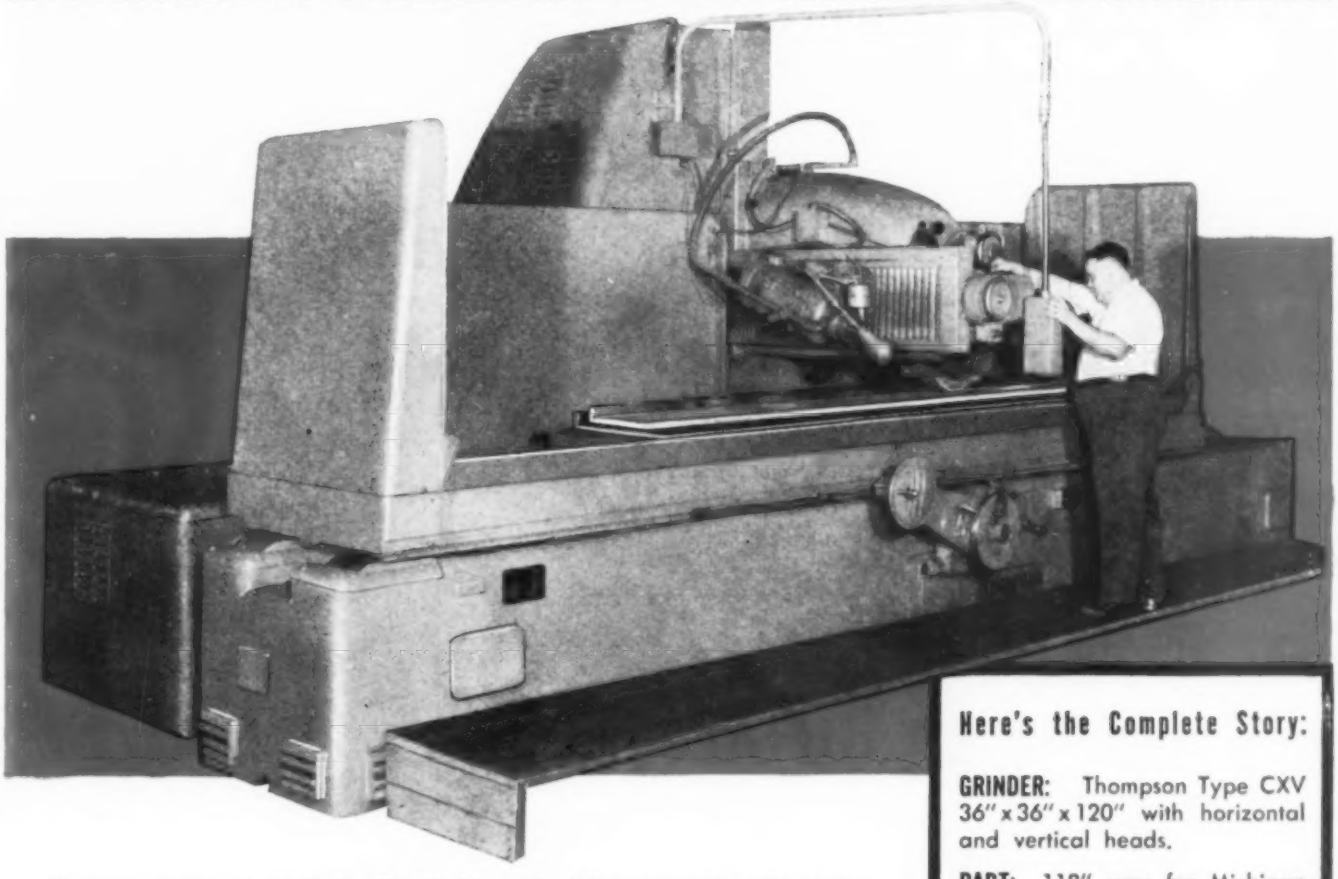
When large parts must be ground to total tolerances of .0005" or less . . . .

THOMPSON GRINDERS WITH THE NEW HYDRA-COOL HYDRAULIC SYSTEM SOLVE THE PROBLEM!



Machine ways up to 118" for The Michigan Tool Company's Roto-Flo Spline Rollers must be ground to .0005" total tolerance. Heat distortion, caused by hydraulic heat, became a critical problem in achieving this tolerance.

During the three months of operation since the installation of Thompson's new Hydra-Cool Hydraulic System*, these long ways are being ground to consistent .0003"-.0004" total tolerances. Heat distortion is eliminated. Scrap loss is reduced to zero. Grinding time is greatly reduced.

THOMPSON GRINDERS WITH THE NEW HYDRA-COOL HYDRAULIC SYSTEM MAY BE THE ECONOMICAL SOLUTION TO YOUR GRINDING PROBLEM. WRITE TODAY FOR FULL PARTICULARS.

Hydra-Cool also offers you these exclusive advantages:

- Heat damage to hydraulic seals, valves, controls and pump is eliminated.
- Break down of additive-type hydraulic oils is prevented—sludge will not form in the Hydra-Cool System.
- Lengthy warm-up periods are eliminated.
- Power costs are greatly reduced.

Hydra-Cool is standard on all Thompson surface grinders 40 inches and up in work length AT NO EXTRA COST.

Here's the Complete Story:

GRINDER: Thompson Type CXV 36" x 36" x 120" with horizontal and vertical heads.

PART: 118" way for Michigan Tool Co. Roto-Flo Spline Roller.

RATE OF TABLE TRAVEL: 100 ft./Min.

MATERIAL REMOVED: .065".

METAL: Flame hardened Ductile Iron.

WHEEL: 20x4x12 H Grade.

SCRAP LOSS: None.

GRINDING TIME: 3-4 hrs.

Thompson SURFACE GRINDERS

THE THOMPSON GRINDER CO., Springfield, Ohio, U. S. A.

*Pat. Applied For

*"Keep **THOMPSON** in mind for that daily grind"*

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the BIG difference in DIAMOND WHEELS

BOND... the big reason why diamond wheels by J. K. Smit meet your requirements

EXPERIENCE... gained from many years of testing cementing mediums and fillers

QUALITY CONTROL... that insures even distribution of diamond particles throughout every wheel

ONE SOURCE... that manufactures all types of metal, vitrified and resinoid bond diamond wheels

Your copy of Catalog #54 is awaiting your request. Call us direct on any standard or special application

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Letters . . .

Testing Snagging Wheels

Approximately four or five months ago I recall seeing an article in your magazine called, I believe, "How to Test Snagging Wheels." The article was written in conjunction with Peninsular Grinding Wheel Co.

I would appreciate several reprints, if possible, or at least a copy of the magazine if it is available.

E. J. Niccolai
Industrial Engineer
Allegheny Ludlum Steel Corp.
Pittsburgh 22, Pa.

Stainless Steel Finishing

We would very much like to have tear sheets of Part I of "A Guide to Stainless Steel Finishing," by W. E. McFee, to go along with Part 2, which appeared in the August issue.

This is a well written article, and we hope you can provide the tear sheets requested, directing them to my attention.

Just a suggestion. The reader cannot determine, when these articles appear in two or parts, whether there are more to follow. Would it not be possible for you to mention in the initial article whether or not it would be a two or three-part article so that he could be on the lookout for the succeeding articles?

H. K. Smyth
Vice Pres. and General Mgr.
Saco-Lowell Shops
Sanford, N. C.

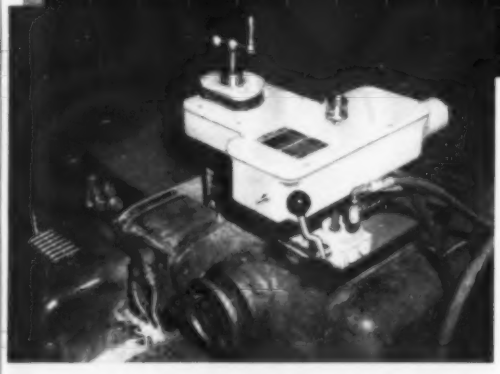
It is our policy to indicate how many parts there will be to a certain article, but in this case there was some doubt as to whether we would publish Part 2.

"I know you'll enjoy meeting my shop foreman, dear—you two have so much in common."

hoglund contour dressing...

Concave radius ground to .9680"

Tapered flat ground to 11°30'00"



Hoglund Model 79 Dresser features automatic, hydraulic operation.

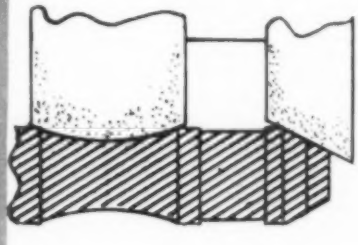
puts metering valves on production • grind basis

"Tenth tolerance" grinding — while routine with Hoglund Contour Wheel Dressers — need not be your prime requirement for their profitable use. Hoglund production economies are equally important.

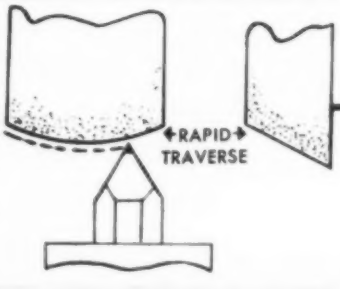
For instance, Hoglund dressers enable grinding of several faces simultaneously, as on this metering valve. In tooling up for the valve, the manufacturer found that ordinary wheel dressing techniques would require two separate grinds to maintain repeat accuracy at the desired rate. Choice of a Hoglund Model 79, however, enabled generation of the contours with one dresser and one grinding pass.

Like all Hoglund dressers, the Model 79 features: inclined plane cam reduction system; precision hardened and ground ball raceways and slides; automatic, hydraulic operation; maintenance-free service with assured repeat accuracy.

Whatever your problem — complex contours, accuracy to tenths, or the dictatorial need for economy — specify Hoglund. Over 120 models available for all types of new and existing equipment.



Double face wheel simultaneously grinds radius and flat.



Optically pre-set diamond dresses both faces in one pass.

Send for brochure on solutions to tough profiling problems.

HOGLUND

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341 Snyder Avenue • Berkeley Hts., N. J.

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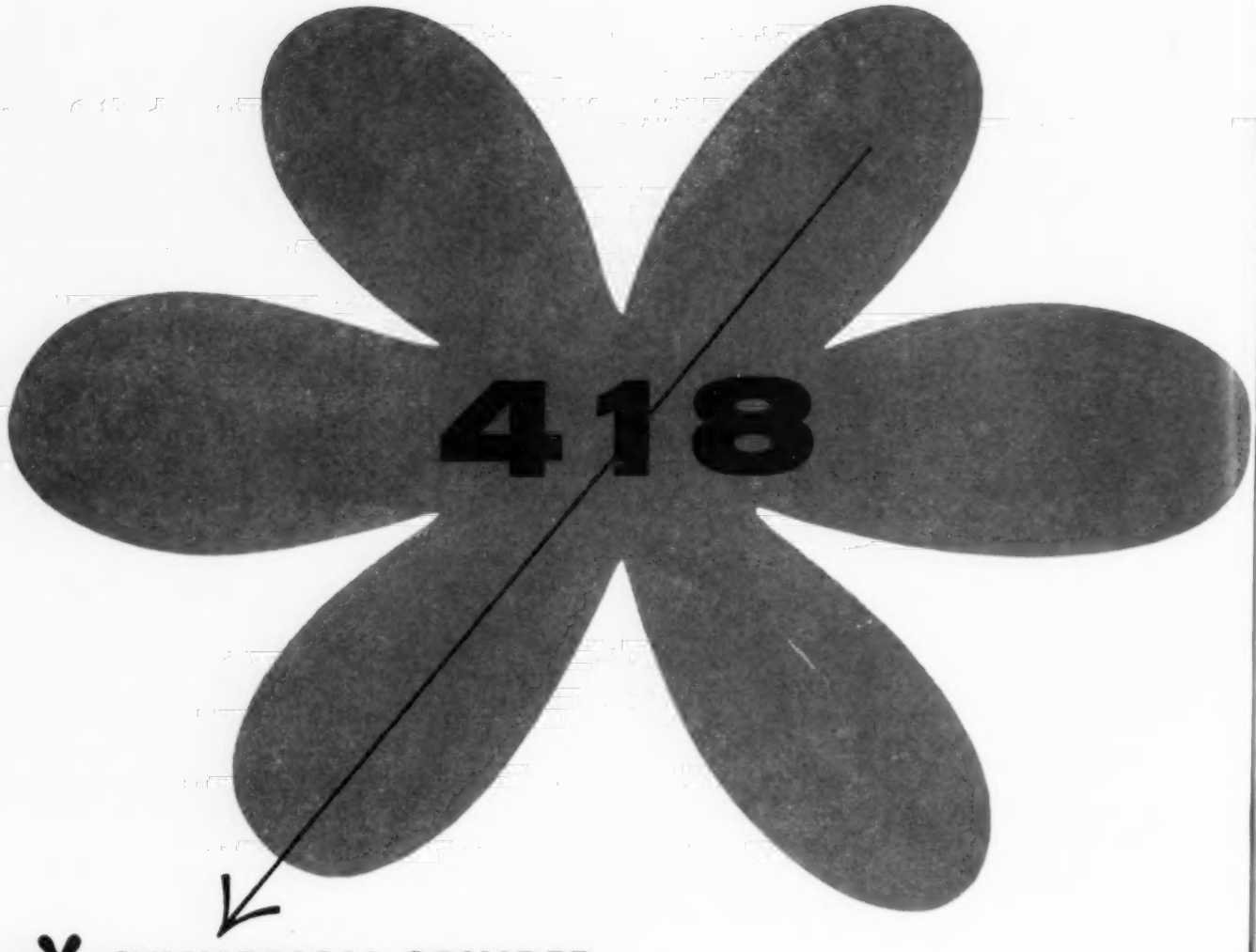
VAN NORMAN



CYLINDRICAL GRINDER

The Van Norman 418 Cylindrical Grinder is engineered to give you fast, accurate, low-cost plunge and traverse — small parts grinding, particularly if you have small or medium sized runs.

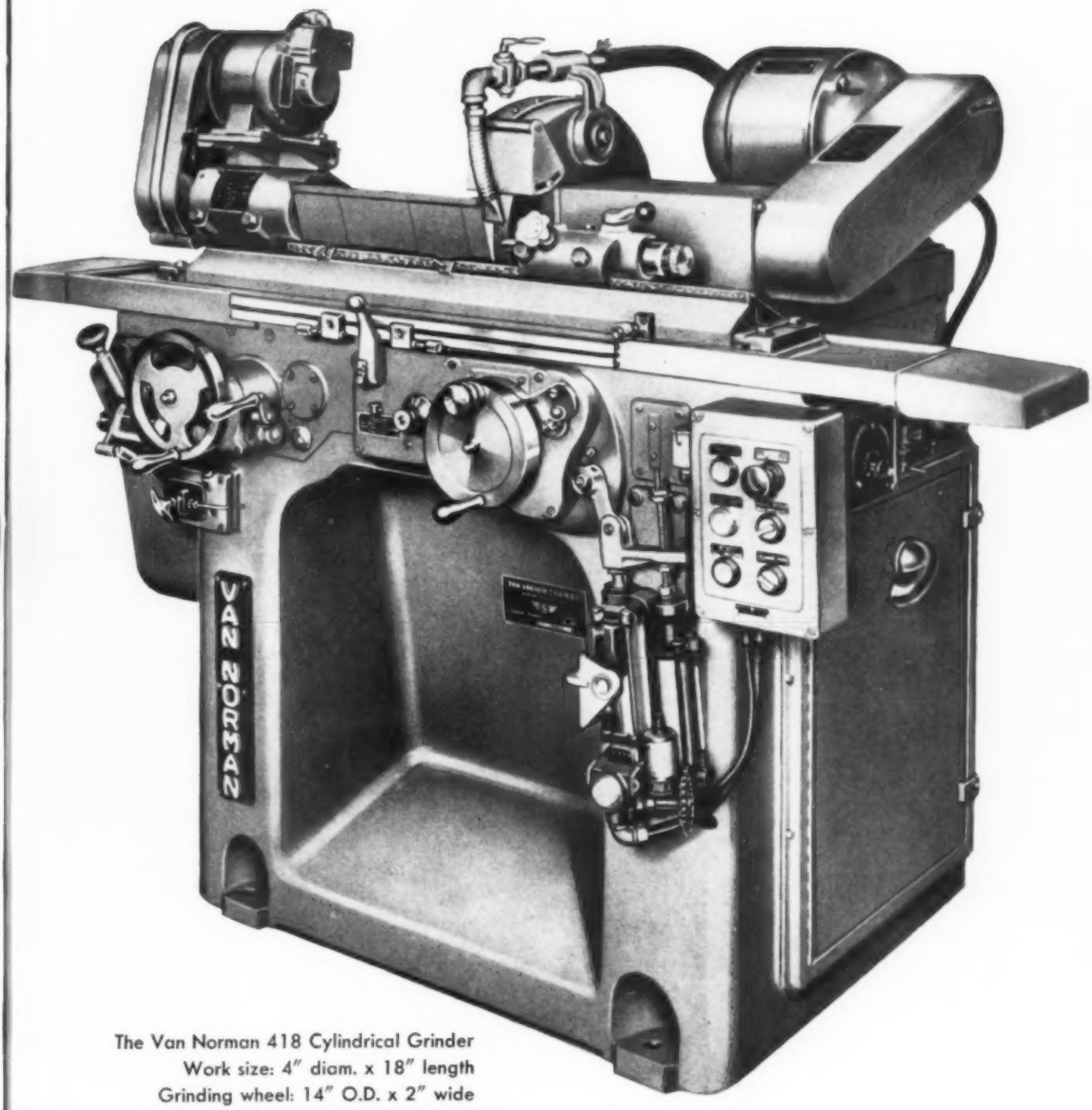
With the 418 you get big machine economy and performance at small machine cost. Setups are quick and easy . . . workpieces are easily loaded, ground and unloaded. Get full details on the Van Norman 418 . . . write, wire or phone now for complete specifications.

VAN NORMAN MACHINE

a division of Van Norman Industries, Inc.

MANUFACTURERS OF — Ram and Column Type Milling Machines, Cylindrical Grinders, Spline and Gear Grinders, Oscillating Radius Grinders, Special Production Grinders, Centerless Grinders.

Plunge and Traverse Grinding



The Van Norman 418 Cylindrical Grinder
Work size: 4″ diam. x 18″ length
Grinding wheel: 14″ O.D. x 2″ wide
2 HP wheel motor (3 HP optional)

COMPANY

SPRINGFIELD 7, MASSACHUSETTS

Don't wait . . . for extra profits install a Van Norman grinder now! They are available in many purchase plans . . . Outright sale . . . Purchase on conditional sales contract up to five years . . . Pay as you depreciate up to 10 years. Conditional Sales Contracts not available to Export.

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P. O. BOX 180, MAPLE ROAD EAST BIRMINGHAM, MICH.
Polishing, Buffing, Grinding, Filtering Equipment that automatically cuts your costs.
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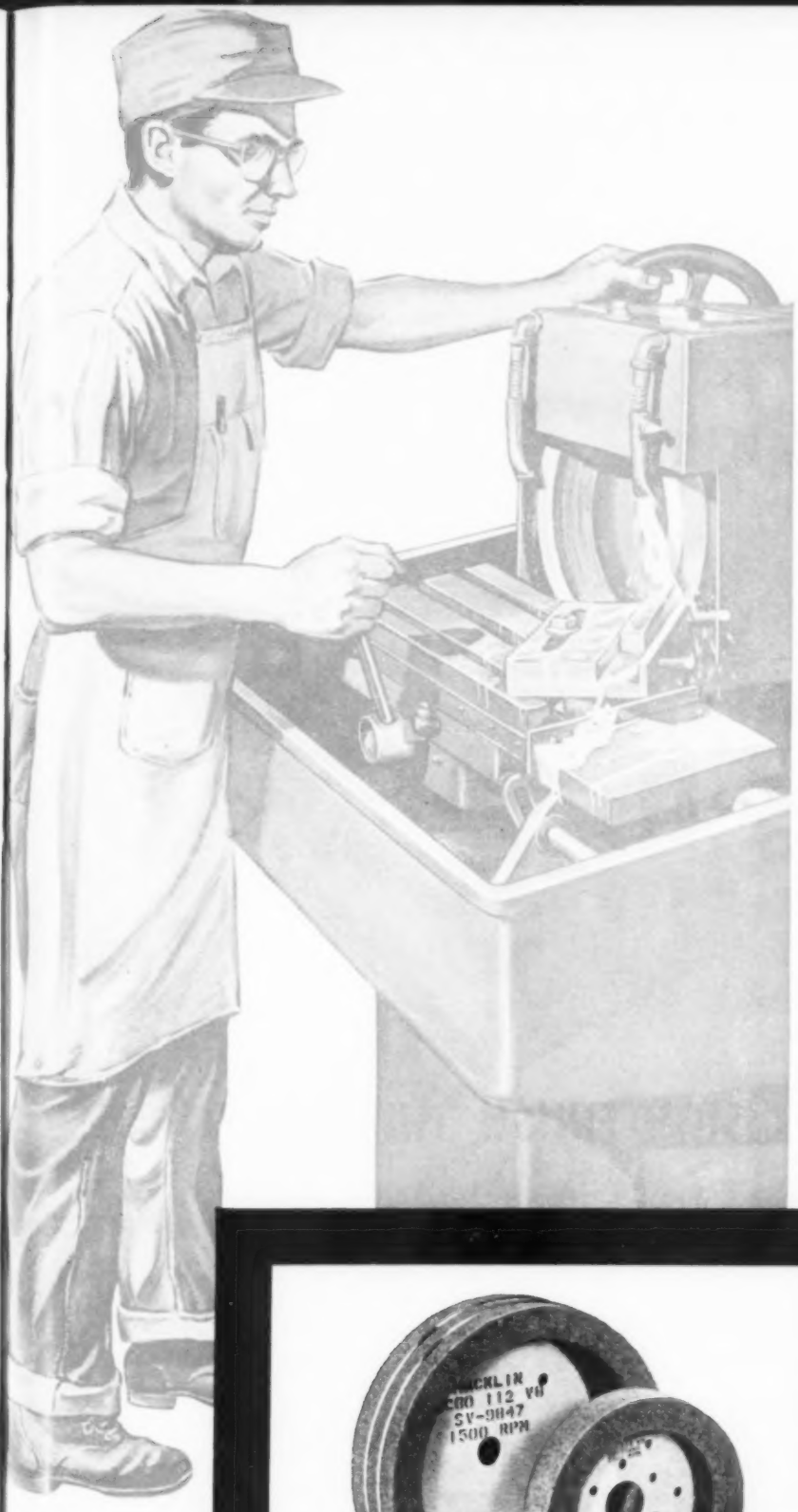
Industry Observer

Methods and machines to speed the handling of mail are the objectives of a current research program at the National Bureau of Standards. Under the sponsorship of the Post Office Department, the Bureau has established the basic principles of a system for automatically sorting letter mail and is presently supervising development of both large- and small-capacity prototype machines that embody the concepts of this system. Most of the actual equipment construction is being placed in the hands of private industry.

The handling of mail is now a major economic problem within the Government. The Post Office Department estimates that in 1956 it handled over 48 billion pieces of letter mail alone. The amount of mail has been increasing exponentially almost since the inception of the postal service and indications are that this rate of expansion will continue for years to come. To keep up with this tremendous growth, the Post Office Department has been seeking mechanized methods to assist its personnel. In recent years, certain engineering techniques have been perfected that could well be applied to the mechanical sorting of mail. The potentialities of some of these techniques—such as punched card sorting and coded character reading—have been investigated by the Bureau to see how they could be applied to alleviate the large-volume high-speed letter sorting problem.

Scientific manpower in the Federal Government—nearly seven percent, 142,000 persons, of a total of two million Federal employees in 1953-54, were engaged in the conduct of research and development and related activities, according to a report released by the National

(continued on page 16)

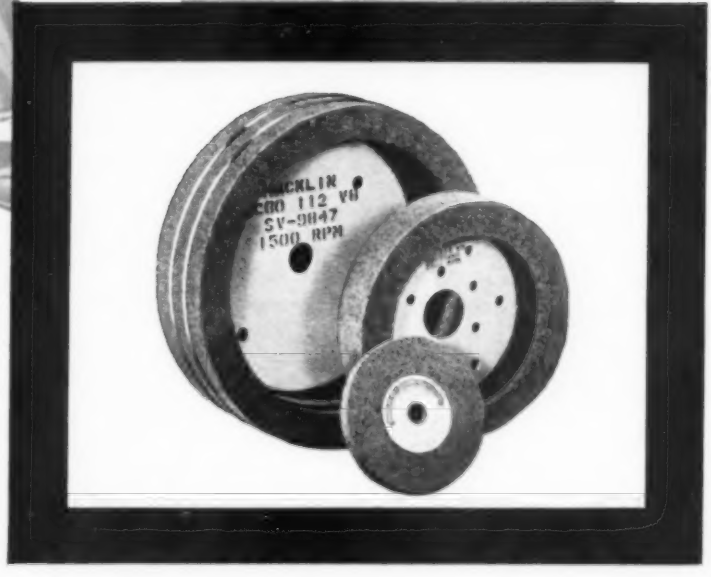


what MACKLIN V-8 wheels have saved for others is not near so important as what they will save you

IF YOU GRIND CARBIDE, you ought to try Macklin's newest "Wheel of Profit" on *your* job to get the FEEL of it. V-8 is easy on tools, easy on the operator's wrist. It cuts *fast* and *cool* without operator fatigue. Production goes up!

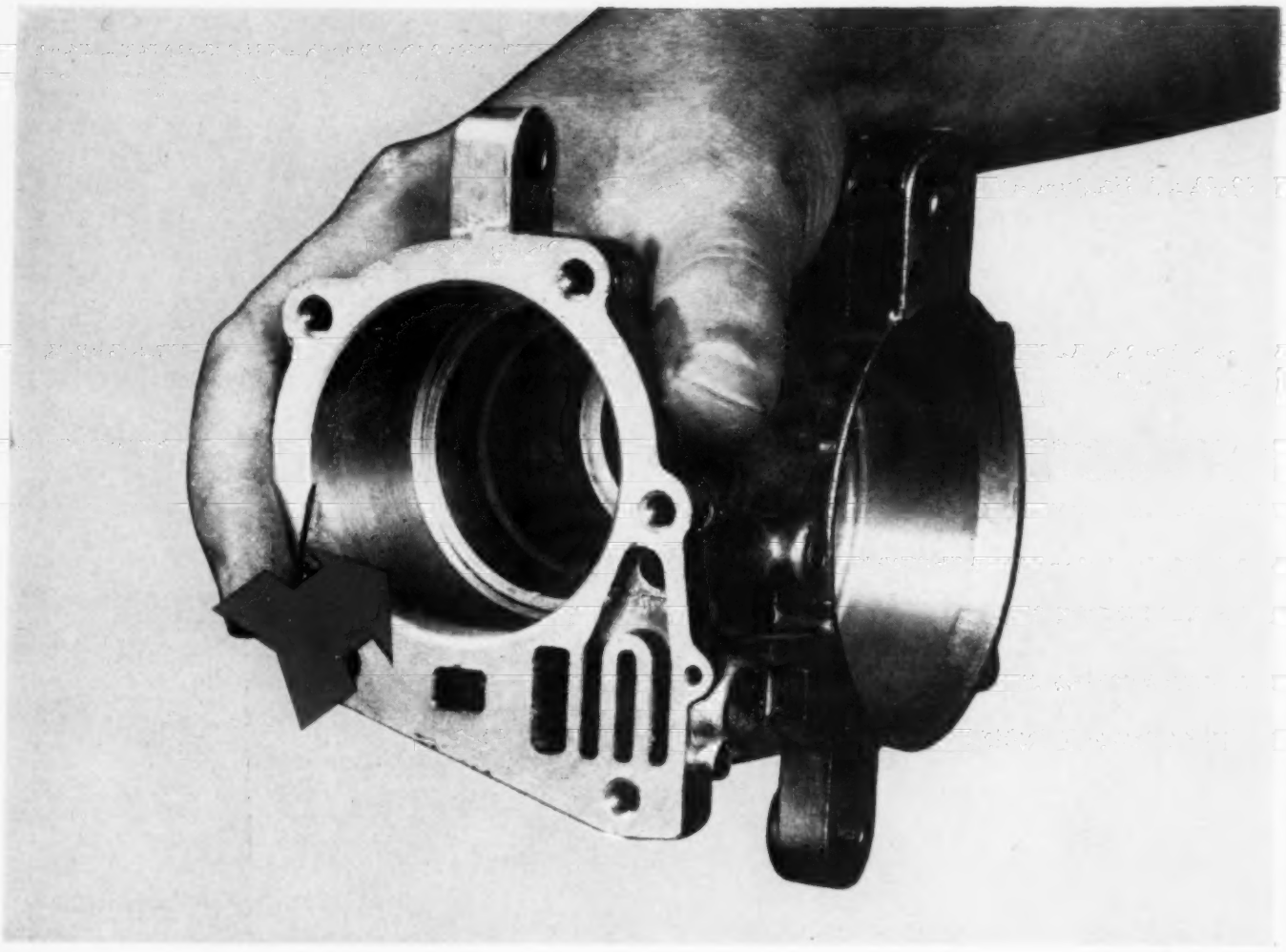
Here's proof . . .

V-8 non-slotted wheel *saved 10%* on purchase price over slotted wheel previously used...and customer reports "Though the V-8 wheel lasted only a couple of hours longer, *it produced almost twice as many tools as the competing wheel.*"

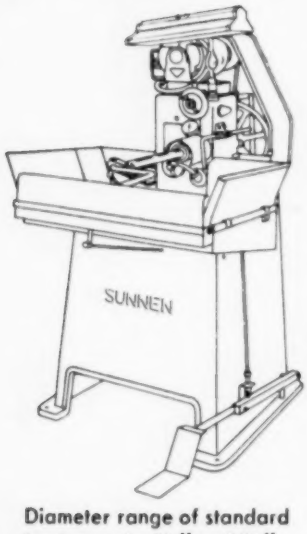


Write today for V-8 literature and wheel recommendations.
While you're at it, arrange for a trial demonstration. Just call your nearest Macklin distributor, or if you prefer, write direct.

MACKLIN company **Dept. 63, Jackson, Mich.**
MACKLIN OF CANADA, LTD., Harrow, Ont., Canada



HOW WOULD YOU PRECISION-FINISH THIS BLIND HOLE?



Diameter range of standard honing tools: ⅛" to 2⅝".

This die-cast aluminum valve part called for a geometrically perfect round hole . . . with maximum finish of 16 micro-inches, neither obtainable on precision boring equipment.

The simple solution was to follow the boring operation with Sunnen Honing . . . leaving just enough stock to correct errors and produce the required finish.

Sunnen Honing maintains previous alignment, guarantees tolerance to .0001" . . . and assures consistent precision-finish from part to part. The part stabilizes itself on the honing tool and requires no chucking or fixtures. Thus, the hole can be gaged at any time until the specified size is reached. Result is geometric accuracy of roundness and straightness. No scrap loss!

Average Sunnen Honing Machine installation with tooling is about $1,000.

send for five informative

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Reduce your barrel finishing costs with SIMONDS ABRASIVE CO.

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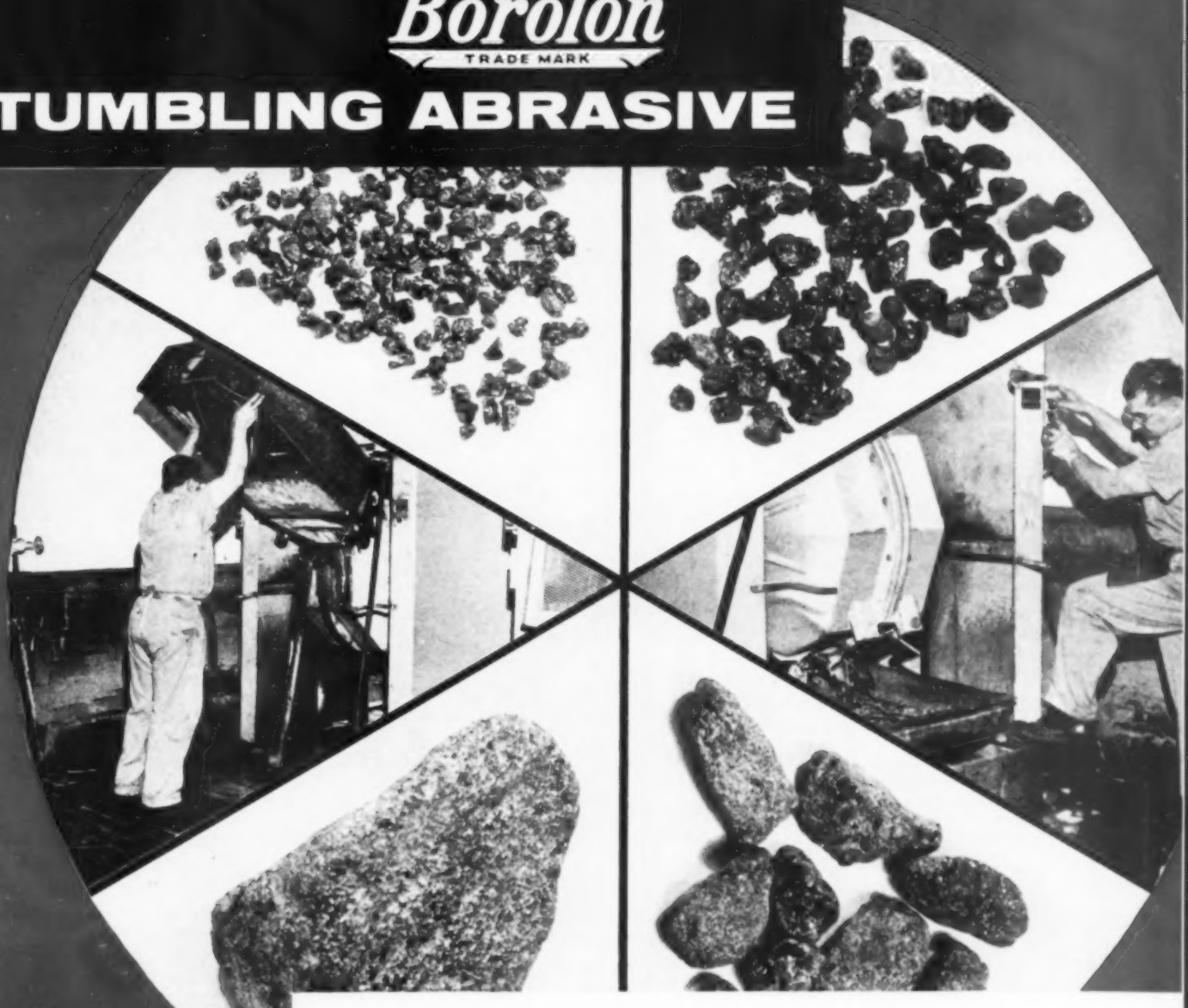
TUMBLING ABRASIVE



Aluminum oxide chips for tumbling and precision barrel finishing, even to micro-inch limits. Each chip a dense, solid mass with multiple abrasive surfaces. Pretumbled to remove sharp edges and flat spots. New sizing standards provide more sizes and greater accuracy. Used in all types of tumbling equipment. Send for new bulletin ESA 236.

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Quick supply

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BETTER FINISHING

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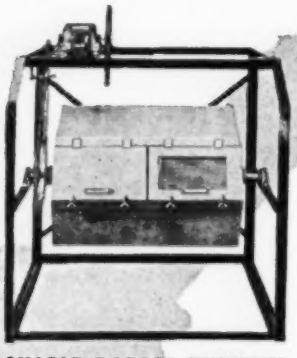
Tumblers and Buffers give you SUCCESSFUL PRECISION FINISHING with high savings.

Yes! Kramer's Noiseless, chain-driven Tumblers CUTS DOWN YOUR LABOR COST . . . DEBURRS, DEFLASHES, POLISHES to give you the "PERFECT FINISH LOOK" desired to meet your highest standards.



SINGLE BARREL TUMBLER

Size: 30" x 36" or engineered to your specifications. Barrels lined with kiln-dried and glued maple. Child's play to operate. Economical on space as motors are individually mounted overhead—double decked or single. Tumbling supplies available also.

BUFFING LATHE

1 to 7½ H.P. Ball Bearing V-Belt Drive. Pre-determined speed set at factory or to your specifications. Buffing wheels and compounds available for every industry . . . Special compounds recommended for Special applications.

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Industry Observer . . .

(continued from page 12)

Science Foundation. Approximately 37,000 were scientists and engineers and the remainder were supporting personnel.

In addition to the 37,000 scientists and engineers, all of whom were engaged in scientific activities, another 65,000 were employed in construction and operations work. Included in the 102,000 total, 25,000 were physical and mathematical scientists, 70 percent of whom were engaged in scientific activities. The remainder, 77,000, were either engineers, life or social scientists, about 25 percent of whom were employed in scientific work.

Two percent, 77,000, of all military personnel were also engaged in scientific activities. About 9,000 were scientists and engineers, and the remainder supporting personnel.

American steel-making capacity will increase 10 per cent in the next two years, so says William Butler III, Assistant to the Director of Market and Commercial Development of Lukens Steel Company.

"By 1959, our estimate is that the industry will have raised its annual capacity from the present 133.5 million tons to more than 146 million tons," Mr. Butler said at the Commerce and Industry Conference sponsored by the Chamber of Commerce of Greater Philadelphia.

"We are sure that long-term customer requirements fully justify this expansion . . . . if the steel industry had not expanded by nearly 20 per cent in the past seven years, we would not have had to operate at the impossible rate of 120 per cent of current capacity to supply the estimated 116 to 118 million tons needed this year."

The American Office: a source of profit or a necessary overhead?— In the rush of expanding operations in the post-war boom, American management has let the office lag behind the plant in both productivity and scientific management. Figures show that the ratio of office workers to production workers has been rising at a rapid pace. Fifteen years ago there were 16 non-production workers for every 100 production employees; now there are 28.

More computers are in use than most management people realize, according to a survey made by Dun's Review and Modern Industry. Almost 22 per cent (82 concerns) of the surveyed companies now have at least one general purpose office digital computer in use. Another 28 per cent (78 companies) are planning to install one within the next three years.

The National Science Foundation announced that applications are now being accepted in four National Science Foundation fellowship programs for advanced study and research in the natural sciences. The four fellowship programs are:

(1) a predoctoral fellowship program for which college seniors and graduate science students may apply;

(2) a postdoctoral fellowship program for scientists who have already received the doctoral degree;

(3) a senior postdoctoral fellowship program for candidates who have held the science doctorate for a minimum of five years;

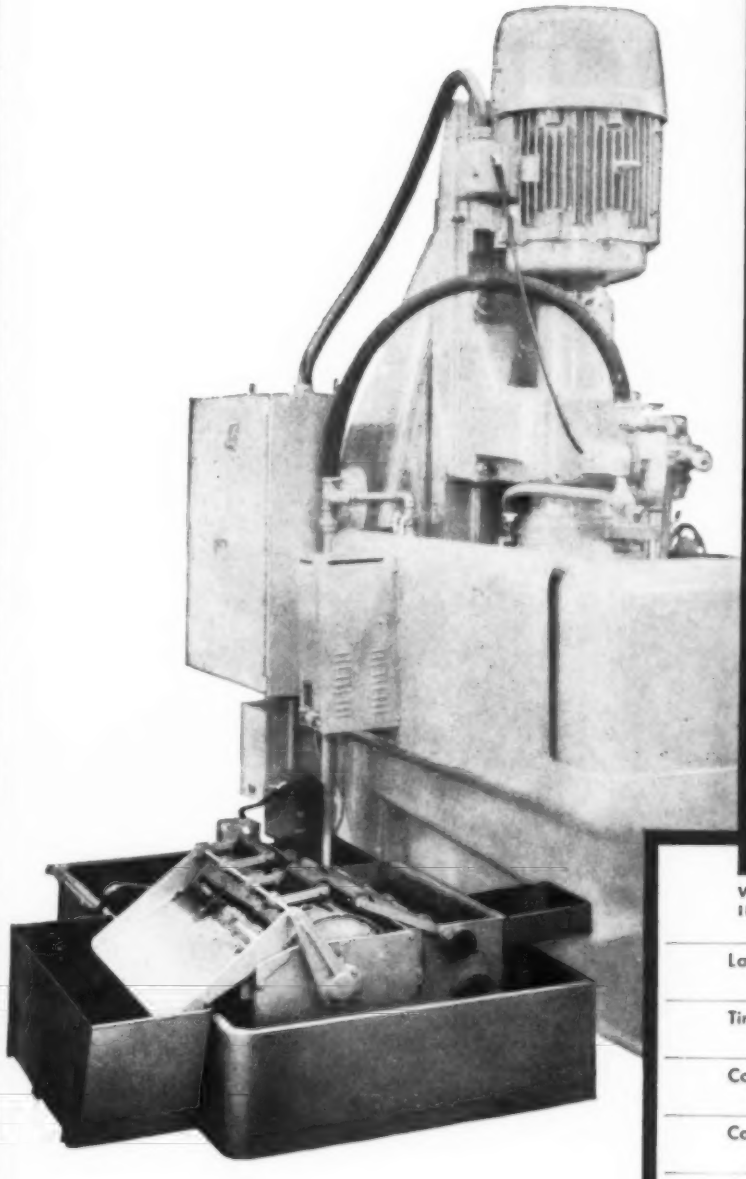
(4) a science faculty fellowship program for college teachers of science who wish to improve their competence as teachers.

Approximately 1000 awards will be made in the Foundation fellowship programs in March 1958. National Science Foundation fellowships are awarded to American citizens who have shown special aptitude in science and who will begin or continue their studies at the graduate or postdoctoral level. Under the broadened program fellowships will be awarded in the mathematical, physical, medical, biological, engineering, and other sciences, including anthropology, psychology

BARNESDRIL

magnetic separator saves $152.50 weekly

...on grinding operations



An Eastern manufacturer installed a BarnesdriL Magnetic Separator on a Hanchett Grinder. After the separator had been in operation approximately a year, they compared grinding costs against the costs previous to the separator installation. These figures showed a weekly savings of $152.50.* The installation cost was returned in savings in less than 6 weeks.

All coolant from the grinder continuously recirculates around the drum of powerful permanent Alinco Magnets in the separator. Swarf, chips, and other ferrous particles are removed resulting in the decreased grinding costs shown. Not shown, but important factors are, the decrease of dermatitis and improved finish of ground parts.

For complete information about BarnesdriL Magnetic Separators, call your BarnesdriL Representative or write for Bulletin No. 300D.

*

WEEKLY COST COMPARISON BEFORE AND AFTER INSTALLING A BARNESDRIL MAGNETIC SEPARATOR

	Before	After
Labor Consumed Cleaning Coolant System @ $1.00 per hr.	$ 12.00	$ 2.00
Time Lost by Machine Operator @ $1.50 per hr.	18.00	3.00
Coolant Compound Used @ $1.50 per gal.	21.00	4.50
Cost of Wheel prorated weekly	37.50	26.50
Machine downtime @ $10.00 per hr.	120.00	20.00
Totals	$208.50	$56.00
Total Weekly Savings	**$152.50**	

50th year

BARNES DRILL CO.

886 CHESTNUT STREET • ROCKFORD, ILLINOIS
DETROIT OFFICE: 3419 South Telegraph Road

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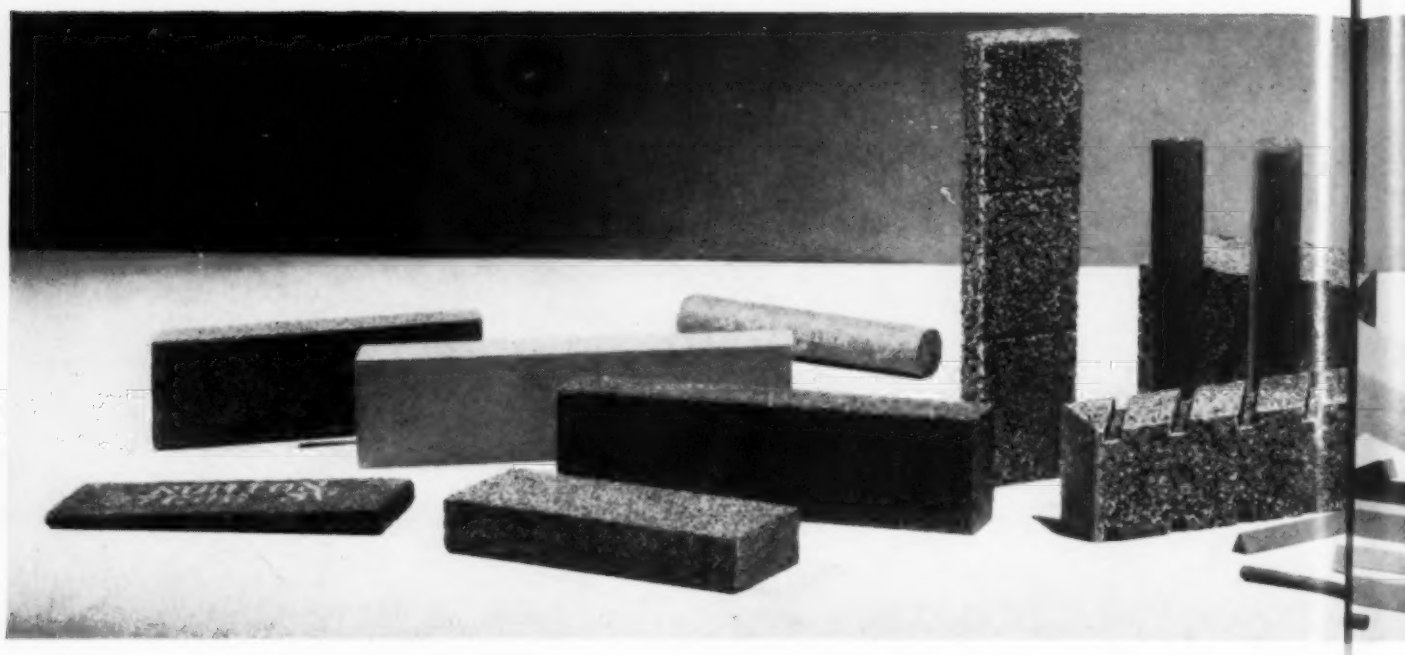
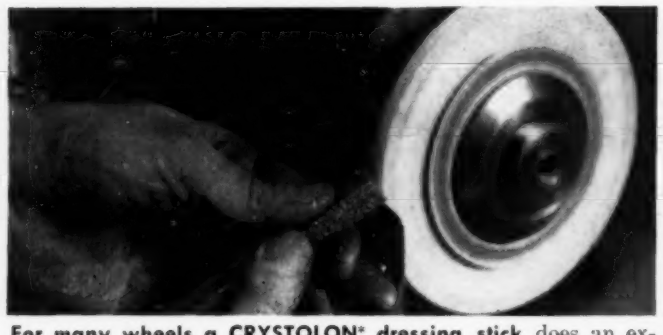


Handy, money-saving "First Aids" fo



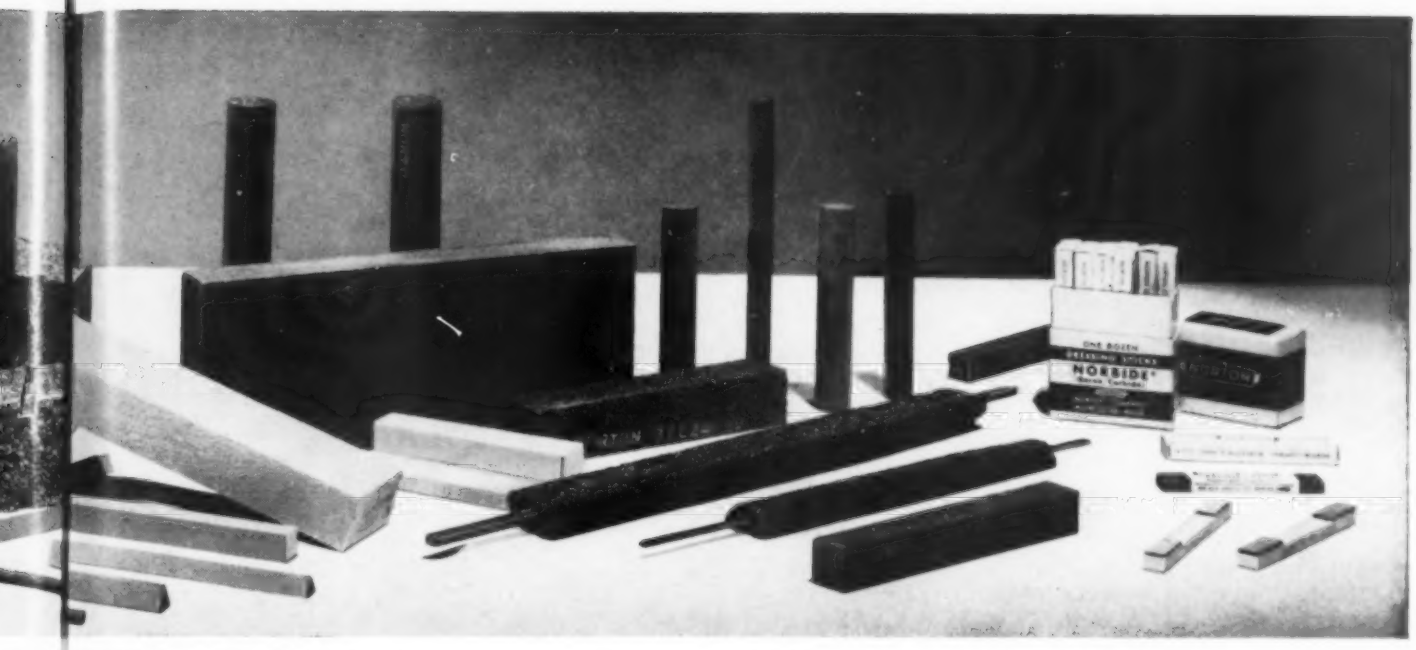
For many wheels a CRYSTOLON* dressing stick does an excellent job in maintaining a uniform cutting surface. With each different type of the famous Norton diamond wheels, for example, a CRYSTOLON stick is supplied in the right degree of hardness for best results in dressing. ALUNDUM* sticks are excellent for smoothing die areas, and Norton BF sticks of ALUNDUM abrasive, reinforced with cotton fiber, are often preferred for breaking edges, hand finishing molds and other small parts.

A NORBIDE* dressing stick takes no time, practically, to touch up a cup or saucer wheel, clean up a wheel face, or form a radius or groove. Just a couple of passes is all you need, in fact, because this outstanding Norton development is next to diamonds in hardness, costs only a fraction of diamonds, and outlasts hundreds of ordinary sticks.

Hardest of all is the Norton diamond hone. Here a vitrified diamond hone is working on the side cutting edge and nose radius of a carbide tipped tool. Honing lightly at a 45° angle is worthwhile protection when the carbide is used for making heavy cuts in steel, since steel scale and chips may cause an extremely sharp edge to flake off.

Cleaning up castings with a CRYSTOLON brick is a quick and handy way to remove sand, scale and parting lines. Bricks of this fast-cutting abrasive are made in a wide range of sizes and shapes, plain surfaced or slotted. They're also highly valuable in a variety of plant maintenance operations, such as smoothing off concrete foundations, walls, or other masonry jobs.

Core files are useful for shaping and smoothing sand cores for hollow castings. Like the Norton bricks they're made of CRYSTOLON abrasive, which gives them the same fast cutting action. And because of their long, slender shapes they're reinforced with metal rods, for added strength and ease of handling.

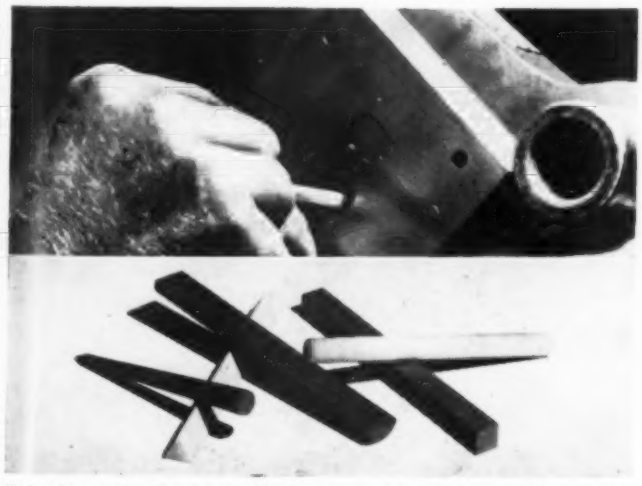


for plenty of plant jobs

Norton bricks, sticks, hones, core files, keep many of your tools, products and equipment in top condition

With Norton bricks, sticks and other hand-operated smoothing implements, you can simplify many everyday plant jobs. You can cut time and expense, too, because you eliminate adjusting or running any machines. Ask your Norton Distributor about all the advantages. Or write to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors all around the world.

W-1826



Behr-Manning Division files are noted for fast, smooth stoning and honing of dies, as well as sharpening. The round file shown in action is an INDIA oilstone. In the smaller photo, Behr-Manning oilstone files for many other industrial uses include INDIA point, half-point and square shapes, and ARKANSAS triangle and round shapes.

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ABRASIVES

Making better products... to make your products better

NORTON PRODUCTS
Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION
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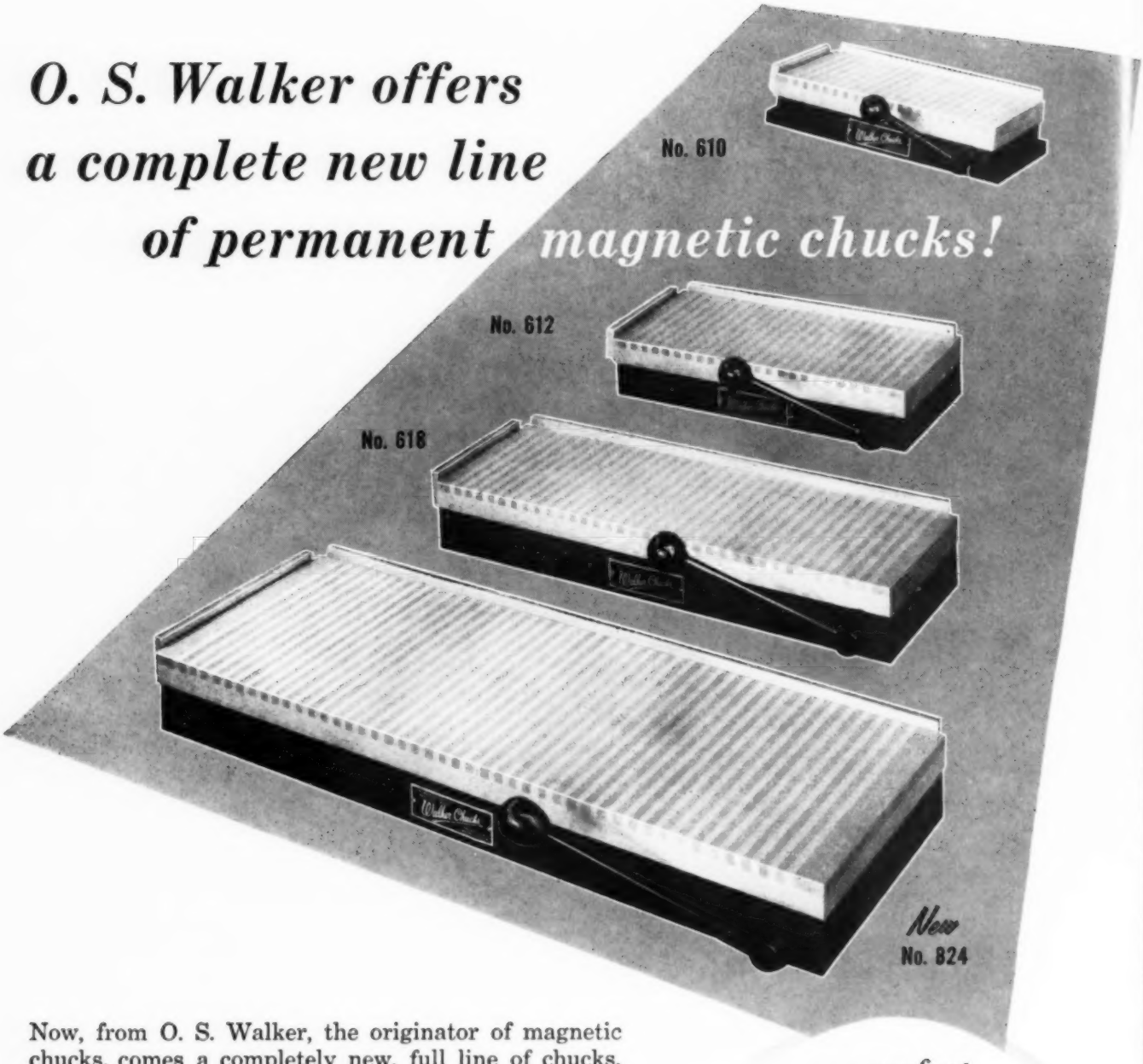
O. S. Walker offers a complete new line of permanent magnetic chucks!



Now, from O. S. Walker, the originator of magnetic chucks, comes a completely new, full line of chucks, with the most permanent magnets ever produced! They're ceramic*, with many times the coercive force of alloy magnets. The face is *all steel,* with no soft insulating material. These chucks offer many important advantages:—

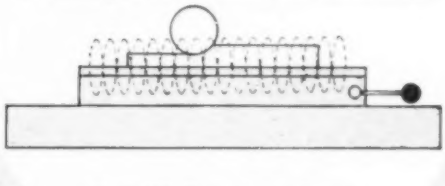
- Weight is 50% less than conventional permanent chucks; minimizes reciprocating table inertia.
- Their low, low height gives greater-than-ever machine capacity.
- Fine pole divisions give maximum holding power.
- All magnetic fields are controlled to prevent magnetization of machine table or ways.

Write for details.

*Patent applied for.

. . . perfect for milling, too!

These new chucks are perfect for milling or planing due to their exclusive construction.† Cutter is constantly *demagnetized* as it progresses, with *no* fouling of cutter and work with chips!



†O. S. Walker magnets are polarized *horizontally!*

O. S. WALKER COMPANY, INC.

WORCESTER 6, MASSACHUSETTS

Permanent magnetic and electro-magnetic rotary and rectangular chucks, demagnetizers, lifting magnets, vacuum chucks.

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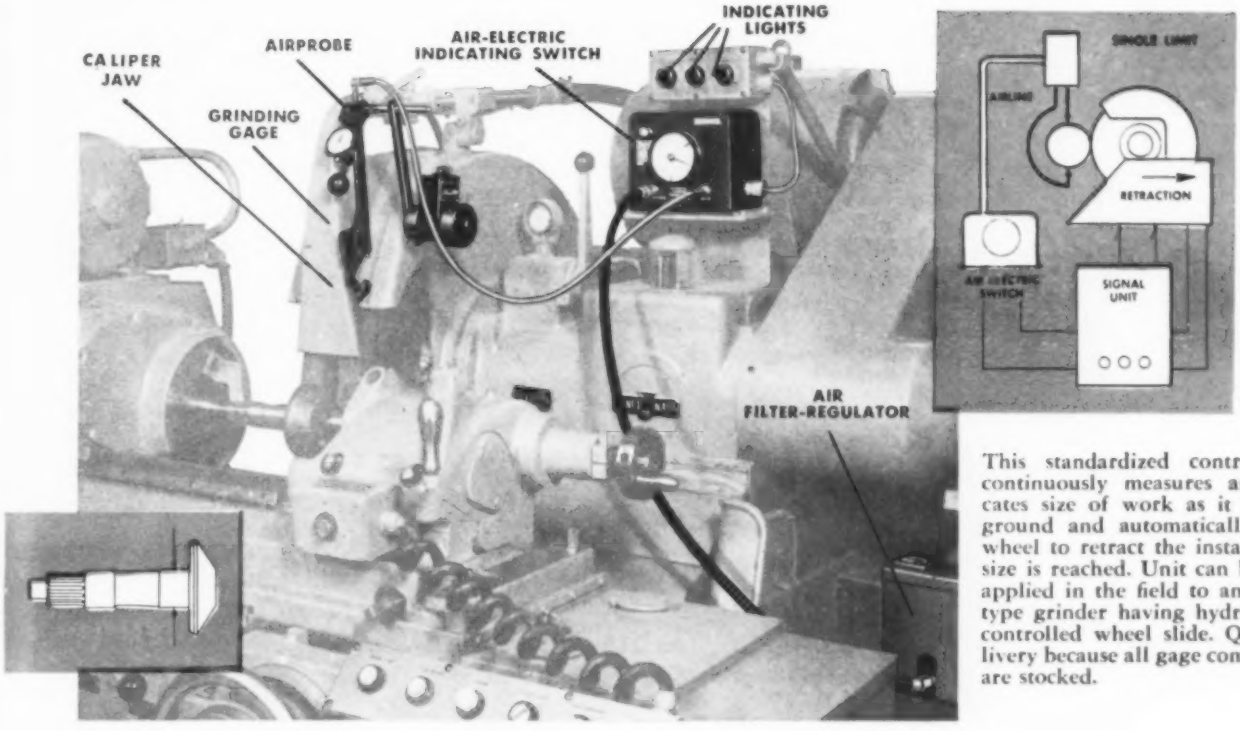
A BETTER PRODUCT...AT LESS COST... THROUGH CONTROLLED GRINDING



This standardized control gage continuously measures and indicates size of work as it is being ground and automatically causes wheel to retract the instant finish size is reached. Unit can be easily applied in the field to any center type grinder having hydraulically controlled wheel slide. Quick delivery because all gage components are stocked.

BENEFITS: *Reduces cost of operation—permits one operator to handle two, possibly three grinders performing the same or different operations. In this way gages pay for themselves within a few months.*

Improves quality—even if you have only one grinder, gage is a profit-maker because it eliminates error due to operator inattention or fatigue and also eliminates cost of later inspection. Gage never tires, is accurate to .0001" or better, is easily adjustable to control different sizes of work. Its Air-Electric system overlooks minor workpiece surface irregularities which confuse size readings of other gages.

VARIATIONS: *Similar FEDERAL Gages are available through machine tool manufacturers to also change wheel feed rate to dwell grind . . . or to control dressing cycle and finish size on I.D. grinders. When specifying machine tool requirements be sure to include* FEDERAL *Gaging.* FEDERAL *maintains close engineering alliance with all leading machine tool manufacturers.*

OTHER GRINDING GAGES AVAILABLE, TOO

Profit margins aren't getting any better . . . just the opposite. With buying appetites fairly well satisfied, it's no longer a matter of "getting the stuff out". The problem now is making it *better at lower cost.* You certainly don't plan to let competition catch up to you. So consider these ways of improving product quality and, at the same time, cutting down on the cost per piece. Advanced gaging — by FEDERAL — can do it. The gaging ideas are proven profit makers. The gages, far from being monsters of automation, are compact, standardized units, realistically designed to provide automatic control or inspection, or both, where it does the most good and at a price that practically *every* manufacturer can afford. And they have reliability . . . the most important single feature of FEDERAL Gaging.

Whether you're big or small in terms of production, ***at least one of these gaging arrangements can pay off for you.*** *It's the truth. Ask us to prove it. Write:*

FEDERAL PRODUCTS CORPORATION
74411 Eddy Street, Providence 1, R. I.

Ask **FEDERAL** *First*

FOR RECOMMENDATIONS IN MODERN GAGES . . .

Dial Indicating, Air, Electric, or Electronic — for Inspecting, Measuring, Sorting, or Automation Gaging

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(other than clinical), geography, certain interdisciplinary fields, and areas of convergence between the natural and social sciences.

A newly developed, highly coordinated changeover system this year will enable Dodge Main to close down for the shortest time in many years while the plant is being readied for production of 1958 models.

Work on new plant layouts prepared as much as nine months to a year ago will begin as soon as the last 1957 car clears the various departments. Inventory of parts and accessories left over will be made at once, and these will be shipped to various storage points throughout the country for use as replacement parts.

"We have to clear or rearrange more than 200,000 square feet of floor space," Patterson, Dodge president, said, "and we plan to do it with a loss of only eight regular working days. This will enable us to recall Dodge's employes with a minimum loss of working time. It will also materially shorten the non-productive intervening period preceding production of the 1958 models."

In previous years, the changeover layoffs ranged from two to six weeks.

Broad proposals to protect college students from high-pressure job recruiting tactics were published by the Chamber of Commerce of the United States and the College Placement Council, Inc.

Entitled "Principles and Practices of College Recruiting," the publication offers a single set of recruiting standards for voluntary acceptance by all colleges and employers, including government agencies.

The Chamber pointed out that in addition to safeguarding students, the proposals would protect the many employers who have refused to high-pressure youngsters they seek to hire after graduation.

Questionable recruiting tactics, the Chamber said, result from the increase in organizations actively seeking future employes on college campuses, from less than 1,500 before World War II to more than 6,000 today.

Among practices disapproved by the new recruiting guide are the bidding up of salary offers by competing employers, elaborate entertainment of prospective student employes, special payments or other gifts, any undue influence on student job choices by faculty members, and expense account padding by students visiting company plants.

new
PROVEN
R-58
SECTIONAL
RUBBER
CONTACT
WHEEL
unequalled Conformability
A NEW CONCEPT IN RUBBER CONTACT WHEELS ! ! !
It actually shapes itself to the work piece . . . conforms to the most difficult contours . . . covers more surface in a single pass. Here, at last, is the answer to those really tough, time-consuming grinding jobs. Consider these outstanding features:
● CONFORMS BETTER — Most versatile of all. Grinds even odd shapes because deep serrations allow it to conform like no other rubber wheel.
● SAVES TIME — Cuts faster because it hugs the contour of the piece and contacts a greater area with each pass.
● INCREASES BELT LIFE up to 200% and better — Production tests prove it. With deep grooved R-58, the belt becomes self-cleaning. It "shells out" and prevents glazing.
● ALLOWS GREATER FLEXIBILITY — Just add wheels for any width, any combination of durometers you need for the job.
● LEAVES NO PATTERN ON WORK — Carefully designed serrations give smooth, overlapping action that eliminate stripe or pattern when more than one section is used.
● LASTS LONGER — Made of new, specially compounded, High tensile long wearing rubber. If one edge wears, just reverse the wheel and it operates as effectively as ever.
Write for complete information.
INCREASES BELT LIFE UP TO 200% & BETTER
It's The WHEEL That makes the difference ! ! !
CHICAGO RUBBER COMPANY, INC.
651 MARKET STREET, WAUKEGAN, ILLINOIS
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Metal removal *faster* at lower cost

CHICAGO MOUNTED WHEELS

Prompt Out-of-Stock Deliveries

There is a precision-engineered Chicago Mounted Wheel or point for every imaginable grinding operation. Ideal for efficient, effective deburring. . . . Always available . . . in all standard sizes, and over 200 special shapes, for out-of-stock delivery. Save Time – Money – Materials . . . Specify Chicago Mounted Wheels!

Every Chicago Mounted Wheel is produced under positive production control . . . assuring perfect uniformity of mounted wheels and points. There is no variation from one production run to another.

Positive density control for peak job performance

Guaranteed to stay on the mandrel . . . perfectly balanced

Chicago Mounted Wheels are easily dressed and hold their shape

Unlimited number of combinations of dimension, shape, grain, size and bond

WRITE FOR *Trial* CHICAGO WHEELS

Test them yourself!

Send coupon for two Chicago Mounted Wheels . . . Test one against the other . . . you'll see the meaning of true uniform performance!

CHICAGO WHEEL & MFG. CO. G
1101 W. Monroe Street • Chicago, Illinois

Send me two sample Chicago Mounted Wheels without charge:

Name .....

Address .....

City ..... Zone ..... State .....

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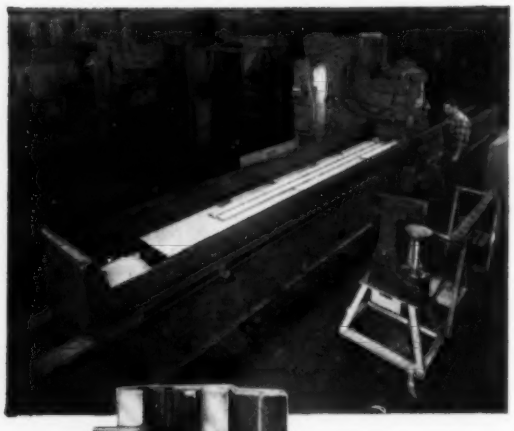
EVERY HEAVY DUTY SURFACE GRINDER SHOULD HAVE:

- *Open-side Accessibility*
- *100% Hydraulic Table Drive*
- *Built-in Spindle Motor*
- *Centralized Controls*
- *Low Pressure Hydraulic System*
- *One-Shot Lubrication System*
- *Adequate Safety Devices*



BUT THEY DON'T—

So GET A HILL with ALL the above features *plus* many other design improvements which insure rapid stock removal and accurate grinding of flat surfaces within the periphery of the grinding wheel. HILL Vertical Spindle grinders are built in table widths of 18", 24" and 30" with table lengths from 5 to 20 ft.

18" x 24" x 204" HILL Vertical Spindle Open-Side Hydraulic Surface Grinder. (Also built in Horizontal spindle design)

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"HILL" GRINDING & POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • ALSO MANUFACTURERS OF "ACME" FORGING • THREADING TAPPING MACHINES • "CANTON" ALLIGATOR SHEARS • BILLET SHEARS • "CLEVELAND" KNIVES • SHEAR BLADES

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Grinding and Finishing

Editor's Page

Don't Ignore Engineering for Sales

Recently I read an interesting news item concerning the active market for high caliber executive personnel. Seems executives are getting scarce. This in itself should not be news because truly competent management timber has always been difficult to locate; we have more wormwood than oak in our management forest. However, aside from that, what interested me in the item was the specific type of executive caliber large corporations are seeking—they appear to be heavily concerned about sales personnel and administrative officers. This is a change from a few years ago when production executives were in demand and salesmen occupied a secondary position.

Thus do times change, and thus does the emphasis in the labor market reflect economic mutations. Business is not static but swings like a pendulum in a continuous arc of varying emphasis. When the pendulum is at the bottom of the stroke all is sunlight and smiles, when it is at either extremes there is more darkness than light, more scowls than smiles. It is only to be hoped that management's understandable interest in sales personnel is not of such extreme nature that the constant need for top engineering and research talent is slighted.

When business is hard to get it is only logical that management turn to the confident-attitude-and-breezy-smile boys to get the orders; if it were otherwise neither you nor I would have jobs. And I do not wish to argue with sales policies or with the importance of hiring good salesmen, but wish merely to sound a warning: Sales are non-existent for the company whose products are priced too high, or whose products look like fugitives from museums rather than the end result of modern production methods and modern design. We can under-emphasize engineering and research to a point where damage is done to the product and thence to the sales volume.

When business is hard to get there is a general tendency to retrench. Sometimes this retrenching takes peculiar forms, such as: Cut down on the research, forget product testing, eliminate the replacement of tools, let's keep this process going for the time being even though it's out of date.

It is highly unwise to retrench in any department which can deliver a reduction in costs, it is short sighted to take funds from any purpose which promises to improve the product. In the emphasis for sales executives, do not ignore top engineering and production personnel.

Remember: There is a direct relationship between production cost and product price; a direct relationship between design and product acceptance.

Wm. J. Schleicher

Vice President, Editorial Director
Hitchcock Publishing Co.

Panorama of the Hannover Messegelande. Ten of these buildings were devoted to the 10-day exhibition.

Grinding and Finishing
NOVEMBER 1957

"We Went to the Messe"

The 5th European Machine Tool Exhibit at the 10-Day Hannover Messe featured 995 exhibitors and 4,000 machines, most of them under power

By **V. C. Hogren**
Executive Vice President
Hitchcock Publishing Co.

• Trade fairs have been part of the European tradition for centuries and are not peculiar to U. S. industry as many Americans believe. These across-the-sea fairs have provided meeting places for buyers and sellers long before the Battle of Bunker Hill.

Hence European industrialists have come to regard trade fairs as a logical phase of any marketing program. Nevertheless, having attended several U. S. machine tool shows and countless other industrial exhibitions, I felt that any exposition produced in Europe could be taken in stride.

With this thought in mind, we left Chicago for Hannover, Western Germany. A cab ride from the Hotel Luisenhof brought us to the fairgrounds or "Messegelande" or Messe as it is better known. Thousands of European type automobiles filled and overflowed a seemingly adequate parking lot. The Messe grounds comprise a series of huge buildings of which ten were devoted to the Fifth European Machine Tool Exhibition which ran from September 15 to 24.

In addition, there was a huge Europa Haus or guest building in which the host countries extended welcomes to foreign visitors and also provided information on machine tool exhibitors from their own countries. The Europa Haus is modern in appearance and upon entering one sees a huge garden with chairs and tables. Along three sides of the building are the booths of the major host nations. Besides the "official" 200 page guide book listing all exhibitors and their locations, one can obtain from each of the sponsoring countries a complete directory of their exhibitors. The German directory, for example, is printed in five languages, has about 290 pages and is classified by machines, exhibitors, locations and trade names. Britain with a 112-page directory devoted two pages to each of the British exhibitors. On these pages are illustrations of some of the machine tools on display. Directories issued by Sweden, France, Netherlands and Belgium also contained pictures of machine tools . . . some including specifications. Italy's and Switzerland's directories merely showed both locations although the latter country produced an additional 80 page "General Index of the Swiss Machine Tool Industry" for English speaking visitors.

The entrance to the Messe is reminiscent of the Chicago and New York World Fairs of 1933-34 and 39 respectively with huge colorful pennants, spacious areas and a

Business is conducted more leisurely in Europe . . .

If you are interested you must so inform the attendant.

water pool flanked by plots of grass. In the ten new buildings were some 995 exhibitors mainly from nine countries of Western Europe. Lichtenstein and Denmark each had two exhibitors with Luxemburg and Monaco with one each. The iron curtain countries were not represented . . . and in fact were not welcome. Neither was the United States.

Real prospects are invited to sit and sip coffee.

The buildings at Hannover are permanent of brick and steel construction. Few columns interfere with exhibits. The buildings can be artificially lighted but rely considerably on daylight from large overhead glass areas. All booths at the Hannover Fair are uniform with no display backgrounds permitted. Booths are identified with painted plywood signs, 20″ long and 12″ high. The name of the manufacturer is painted in black on a yellow background. The city is printed in red. The booth number is in yellow on black with a reproduction of the flag of the country of the exhibitor immediately below the booth number. The booth number identifies the location. For example, booth number 7419 means Building No. 7, fourth aisle and booth 19 in that aisle. Boundaries of the booths are mere chains hung on low standards.

About 4,000 machines having a value of some $45,000,000 were on display and most were under power. Many of the machines were sold before being placed on display. This is done by obtaining permission from the purchaser of the machine which is ready for delivery just prior to the show. The exhibitor usually pays the customer for the delay. Almost all the exhibitors with whom we talked reported sales of equipment at the show. One exhibitor had sold five machines—one of which was priced at $86,000.00. Others reported sales to Europe, Latin America, Asia and Africa.

American machine tool names were in evidence at the fair, but all these builders have European manufacturing affiliates such as Cincinnati Milling, Brown & Sharpe, Cone Automatic, Wiedemann, New Britain, Hammond Machinery, Hardinge and some others. The Amertool group, consisting of ten American machine tool builders, took over the Haus Luise at the Hotel Luisenhof each evening from 5 to 8:30 P.M. where a buffet

Good food in an outdoor setting with orchestra music.

Most of the literature is under lock and key. You must ask for it.

650 West Germany Machine Tool Builders were represented

supper was served. Identification or "membership" cards were distributed to machine tool buyers and this is the way these American manufacturers created goodwill in the absence of actual machines on display. The Amertool group which were the hosts consisted of Blanchard, Cincinnati Milling, Cincinnati Shaper, Cone Automatic, Fellows Gear, Giddings and Lewis, Heald Machine, Jones & Lamson, Micromatic Hone and NATCO.

Literature issued by the various manufacturers was sparingly distributed. Much of it was kept under lock and key and available only on request. In some booths only one of those in attendance was trusted with the key. All others had to ask this "wheel" for literature for a particular account—a strange phenomena to one accustomed to almost promiscuous literature distribution at American shows. Aisles for the most part are wide and carpeted with a cocoa type of matting which is easy on the visitors' feet. The "eager beaver" tactics typical of U.S. industrial shows is missing. If you are interested, you often must tell this fact to one of the attendants. Otherwise you merely look at the machine and its work without someone dogging your footsteps, trying to sell you or get your name or engage in conversation. The assumption is that if you are in the market for the machine you will ask questions and express your interest. Business is done more leisurely and many booths have a small table where *real* prospects are invited to sit and have coffee or perhaps something a little more alcoholic. No one is in a hurry.

A technical report on some of the interesting developments in machine tools and abrasives will appear in the December issue.

Many large and clean restaurants with good food are found on the Messe. Several are of the outdoor type with one in a very delightful setting with fountains and flowers as well as a 12 piece orchestra! During the orchestra's "rest periods" records are played over the PA system. Anyone can select a record to be played from a list of about 250 at each table. Any requests are honored without charge. The first time we passed this restaurant we were somewhat "shook up" when we heard U.S. rock'n roll music.

Nine banks have branches at the Messe, each in an individual "store" along one of the streets. These are available for foreign exchange and travelers' checks. A "Treffpunkt" is maintained. This is a pleasant "meeting place" where visitors can transact business or just sit. The walls on three sides are glass and about 20 feet high. Growing plants and an outdoor pool facing the "Treffpunkt" add to the delightfulness of the place. The postoffice maintains a large office on the grounds.

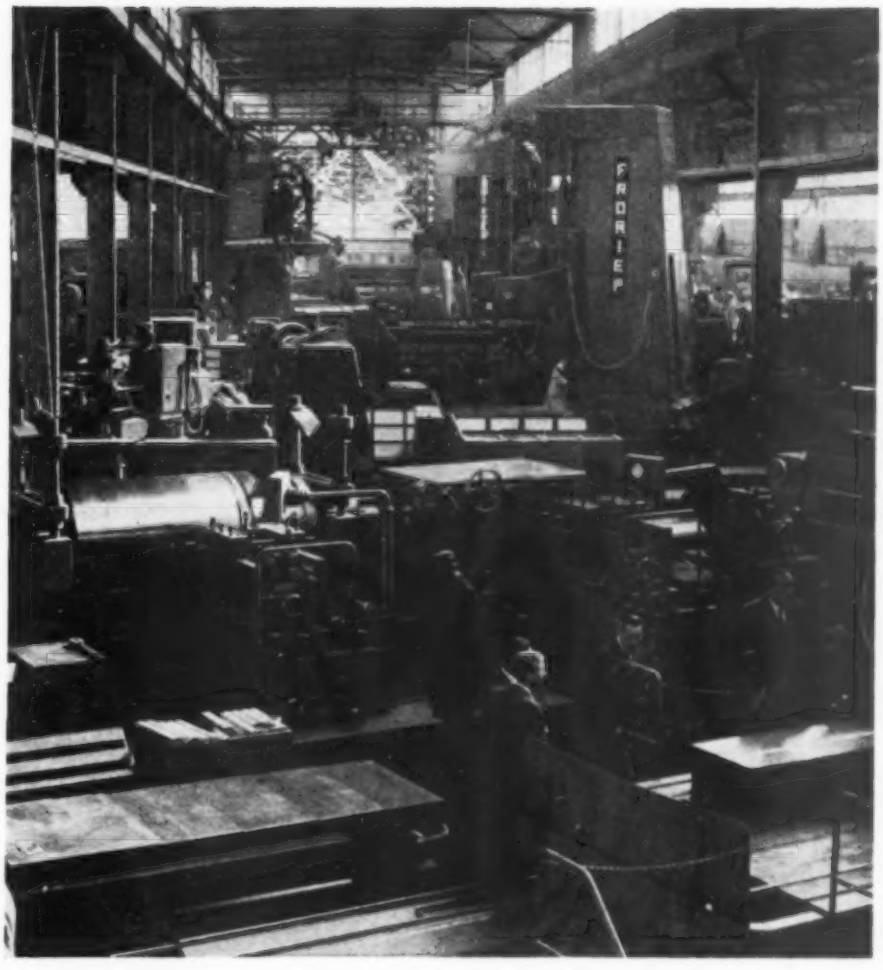
Small carts, many of them colorful and filled with candies, fruits, nuts, coffee (Nescafe), wurst (sausage) sandwiches, and even beer,

One reason for the unusual interest and high attendance was the 3-year interval since the last show.

are pushed by girls back and forth in the buildings and on the grounds. These add to the color and atmosphere of the event. Mail men walk around with a small box strapped around their necks, selling postage stamps. (Such service we never get in Wheaton). Others are selling newspapers, postal cards, cigars, cigarettes and other items. One of our observations was the relatively few Americans on hand to see what the Europeans are showing. However, most machines were of the single purpose type with few automated machines and none of the tape-controlled type.

Metalworking publications of Europe were much in evidence. Their booths were confined to the entrance walls of each building. These publications are in many languages and the printing on the whole is excellent; some even surpass American printing standards. None seem to lack for advertising, and most of this is well done. However, no one publication adequately covered the show. Frequently important or new developments on exhibition were totally disregarded while standard equipment was pictured and described.

The amazing thing to the visitor is the comeback staged by West Germany with about 650 or some two thirds of the exhibitors. Switzerland had the second largest group of exhibitors, or 86. Italy was next with 65 and Great Britain had 44 with other countries following. The Germans have worked hard and put in long hours to accomplish the seeming impossible. Yes, we know American $$ from all of us have contributed, but one cannot help admire the Germans for their industry, skill and ingenuity. The people seem happy and prosperous with work for everyone. The stores are filled with merchandise and even luxury goods. There is an air of "let's go to work" as is evident from the new construction going on everywhere.



The semi-elephant type of machine tools were much in evidence.

Previous European Machine Tool Fairs were held annually from 1951 to 1954. A three year interval between the last show and this one evidently created unusual interest and attendance. The other shows, each of which brought from 200,000 to 250,000 visitors were surpassed by the current Hannover fair. • • •

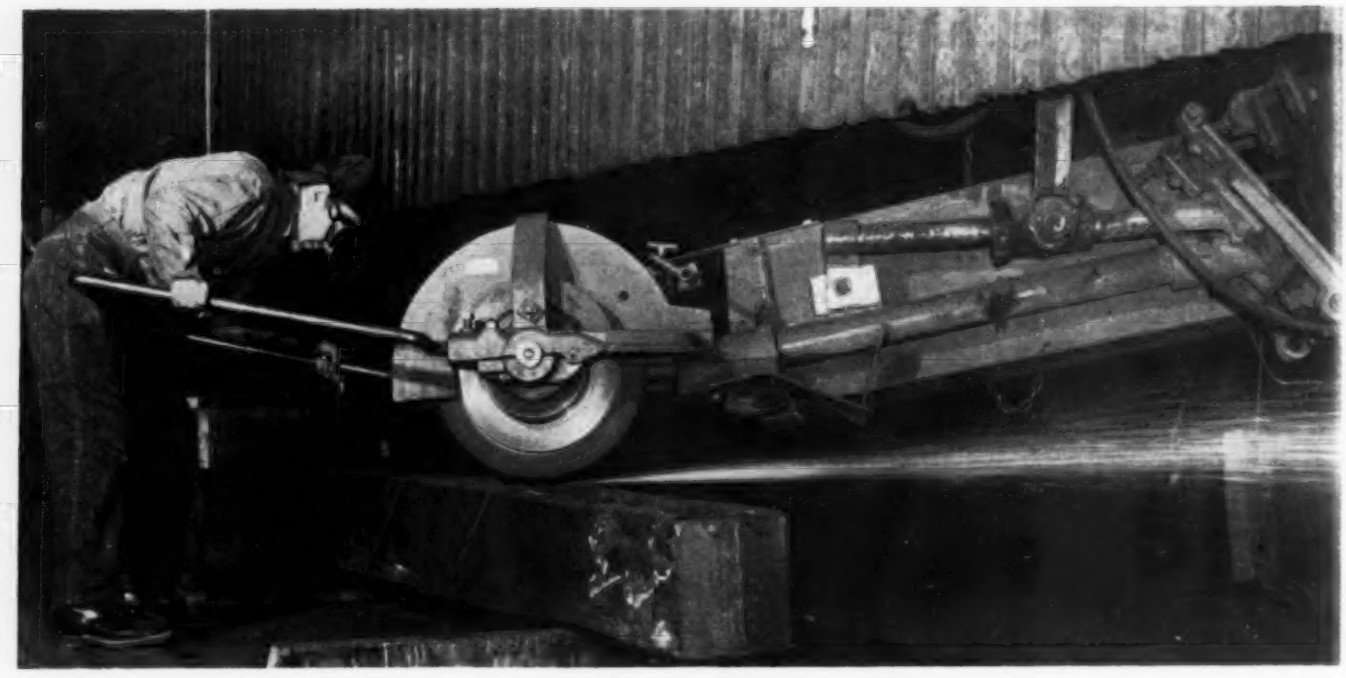
1957 HANNOVER FAIR TOPPED THEM ALL

Location	*Year*	*No. of Exhibitors*	*Area in Square Meters Occupied by Exhibitors*
Paris	1951	852	25,815
Hannover	1952	855	36,165
Brussels	1953	769	32,202
Milan	1954	863	40,965
Hannover	1957	995	53,600 (576,950 sq. ft.)

FUTURE SCHEDULE

1959 Paris
1961 Hannover
1963 Brussels or Milan
1965 Hannover

The Olympia machine tool exhibitions staged by Britain take place every four years with the next events in 1960 and 1964.

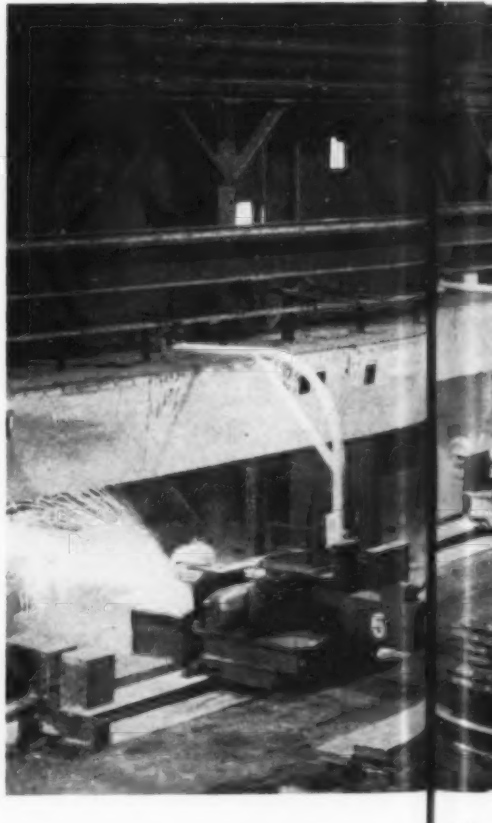


Switch from musclepower to horsepower with

Automati

by **Darrell Ward,**
Field Editor

Case History No. 1 Babcock & Wilcox



● Rolling 5% chrome steel and higher alloys up through various stainless grades presents a real problem. The problem arises not from the rolling so much as from the necessity of preparing the surface of a billet, bloom or slab before it is rolled. While the surface will be nothing like that obtained by machining, it must be clean and free of serious irregularities.

Blooms rolled at The Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa., are about the size of large railroad cross ties and larger.

That means a large surface area to clean up. That much surface is a problem when the material is too hard or too tough to clean up by older methods.

Chipping has been a popular method of preparing the surface of steel ever since steel was first rolled. In the early days, chipping was a hand process performed with air or hand hammers and chisel-like tools. Later, machines similar to a contour milling machine with gang cutters were used for mechanical chipping.

Even these could not do the job on harder alloys. Such material must be annealed before it can be chipped. This is an expensive step added to others in the processing of various alloys.

Scarfing is employed on carbon steels. An oxyacetylene torch burns off the surface of the metal and leaves a smooth, clean finish for

Two Case Histories: Babcock & Wilcox Crucible Steel

- ✓ *grinder operates on 400 to 425 psi*
- ✓ *80% of operators' time spent in actual contact with work*
- ✓ *cost reduction, using automatic grinder, is about 20%*
- ✓ *only one pass with grinder is necessary on billets or blooms*
- ✓ *wheel cost per pound of metal removed has been reduced approximately 60%*
- ✓ *mechanization has economized on supervision*

Billet Grinding

further working. But scarfing is not applicable to all alloy steels.

The higher alloys demand a different kind of treatment: grinding.

Originally, the grinding, or "snagging" of forged billets, blooms and slabs was done with powerful swing frame grinders suspended from overhead. The swing grinder balances a 24-in. x 3-in. wheel assembly on one end and a heavy electric motor on the other. The operator grasps handles near the wheel and applies his weight downward against the work.

It is not easy! Yet, it gets a grinding job done when chipping or scarfing is out of the question. Even so, muscular force, however it may be coupled with electric power, is not the most efficient way of getting a job done.

This, briefly, is what led to recent developments in mechanized snagging for steel mills. Although the mechanized grinder demands more skill from the operator and more maintenance than the swing grinder, it has many features in its favor. It is ideal for materials which cannot be scarfed or chipped. It cleans up flaws and defects in the metal more economically than does the swing grinder. It performs more actual work and does it faster. It eliminates excess physical exertion. It reduces the overall cost of production. It provides safety for the operator.

B & W installed mechanized grinders made by Midwest Abrasive Company. These machines ride on rails running the length of the grinding room. A belt drive reaches out through a horizontal arm to revolve the wheel at variable speeds, compensating for wheel wear. As the wheel wears down and causes the arm to swing lower, a transmission adjustment is used to maintain a constant 9500 surface feet/minute. Downward pressure is regulated by a hydraulic cylinder within the mechanism.

The operator controls movements in all directions with as little effort as the modern automobile driver exerts to control an automatic transmission and power steering.

Also like the modern car, this machine requires as much alert-

Blooms before and after grinding

(continued)

ness and skill in operation. The operator must respond to "the feel of the road" as he makes passes over the uneven contours of a rough bloom. The modern grinder operator must have good perception and dexterity.

Blooms conditioned in the B & W mill generally are 9-in. x 9-in. and 10¾-in. x 12-in. in stainless and chrome bearing alloy types. These are lifted with a floor operated crane and cradled in supporting skids. The grinder works two stations alternately, permitting the classifier to rotate one bloom with the crane while the other is being ground. This alternate lift, turn and grind cycle is continued until all four sides of two blooms are finished.

A classifier inspects each conditioned bloom surface for flaws or defects. If any are found, he marks all such areas for respotting locally. Minor cracks and surface defects must be removed completely because rolling will tend to deepen and elongate them in the finished product.

Respotting is one of the big problems with a swing grinder and offers an opportunity for the mechanized grinder to prove its economy.

When a swing grinder operator regrinds a defective area, he tends to "lean on it" rather heavily.

If the swing grinder bears down too heavily in a small, localized area of the metal, uneven expansion caused from excessive heat may chase a crack right on down into some grades of steel instead of permitting it to be removed by the wheel. This results in still deeper grinding to remove the enlarged defect. Considerable material may be lost.

The mechanized grinder at B & W removes an average of about 3% to 5% of the total weight of the metal in cleaning up all four surfaces of a bloom. The actual depth of grind varies from about 1/16-in. to 1/8-in. Respotting usually takes no more than another ⅛-in. in local

areas. The mechanized grinder, by virtue of its higher contact pressure, spots out the defects with little effort resulting in less thermal problems.

There is no definite specification for the finish obtained in bloom grinding. To a machinist, it would look more like the surface of a rough cut timber than a ground metal surface. It is up to the classifier to determine if the grinding is sufficient. The objective is to present a clean, defect-free surface of reasonably even contour to the rolling mill. Since rolling is done on the red hot metal, after the bloom is reheated in a furnace, the heavy squeezing action of the rolls will "iron out" minor contour undulations.

The abrasive wheels used in this operation are 24-in x 12-in. x 3-in. resinoid bonded aluminum oxide of No. 12 grit in grades ranging from U to W hardness.

Several suppliers have been furnishing B & W with minor variations of this basic wheel and all seem to give approximately similar results. The wheels generally run for about 5 to 6 hours actual contact time.

Each grinder has a contact meter actuated only when full operating pressure of 400 to 425 lbs. per sq. inch is applied with the wheel in operation. Full pressure will not register unless the wheel is operating, and wheel operation will not register unless full pressure is applied at the same time.

Operators work on an hourly basis, but with an extra bonus for metal removal. Metered contact time is used as a basis for establishing the incentive. High contact time in conjunction with a good ton per hour output results in the most desirable grinder earnings. Metered contact time also is issued for other computations relating to wheel test data and efficiency of operation.

A whopping 80% of the operator's time is spent in actual contact with the work.

It used to be far less with swing grinding. But, the operator must be much more alert to prevent removing more metal than necessary.

The mechanized grinder, of course, requires as much maintenance as any other machine performing an equal task. The old swing grinders did not. They used to run for years with little maintenance except belt replacement.

Mechanized grinding also wears down the wheel faster since grinding pressure is higher. Therefore, the total efficiency is not as great as one would suppose. The overall net cost reduction has been estimated at about 20% or less, but even this is a considerable improvement.

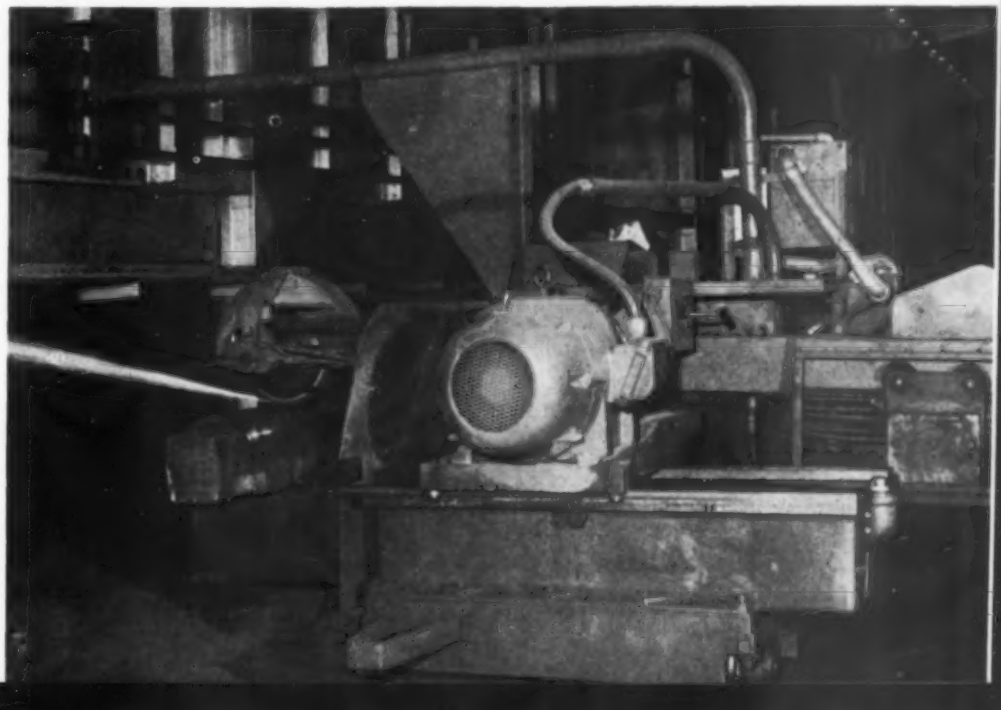
A big feature of the mechanized grinder is that it improves working conditions for the operator. Instead of facing a day on a difficult job in the shop, a grinder operator now sits comfortably behind a protective shield and manipulates his controls with relative ease.

The development of the mechanized grinder is believed to have forced a general improvement in bloom grinding. Since the machine exerts so much more pressure on the wheel, stronger and better wheels had to be made for the job. Wheels now available are much stronger and denser than the older wheels formerly used on the swing grinders.

It was about two years ago when B & W tested their first mechanized grinder for a period of six months to see what it would do. Based on the success they had with that first one, they purchased three more

Two close-up views of the working end of the automatic grinder. Note, in the top illustration, how the wheel can be swiveled for greater effectiveness when needed.

Here is the new way of grinding blooms. This Midwest Abrasive Company machine eliminates all the muscle power and turns out many more pieces per day. Overall economy has been boosted about 20%.



(continued)

Wheel cost per pound of metal removed has been reduced approximately 60 per cent

Case History No. 2 Crucible Steel

and have kept them in steady operation ever since.

The principal application of mechanized grinding at Crucible Steel's Midland plant is on stainless steel slab grinding.

Although similar operations are performed on some billet and bloom stock, the total material ground in these forms is considerably less than half of the total tonnage of slab conditioned for finish rolling each month.

Billets which are ground instead of being chipped or scarfed would include material for rolling into cold-heading quality bars and some alloy grades of steel. Also, material for rolling into bars of ball and roller bearing quality, such as 52100 and 51100 bearing steels.

Crucible's slab stock in stainless grades ranges in size from 20-in. to 50-in. wide, 100-in. to 150-in. long, and 2½-in. to 7-in. thick. These and alloy slabs are rolled into sheet and strip.

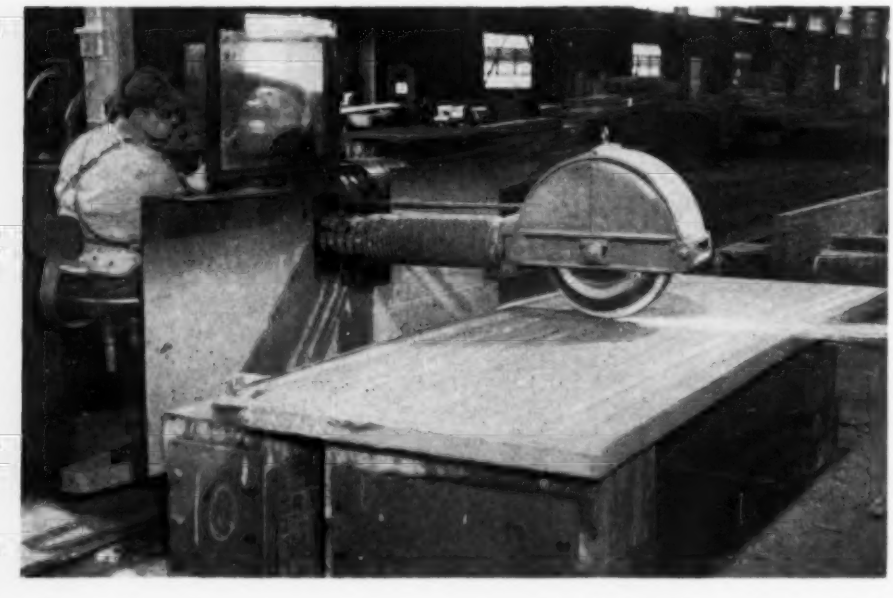
All these materials, in billet, bloom and slab, are conditioned by being "skin ground," to remove only the outer scab of oxidized surface so that clean, bright metal is presented to the finish rolling mill. The actual thickness of material removed varies with the form of the metal being conditioned. About three per cent is considered normal for slab stock, based upon approximately 1/64-in. of skin per inch of slab thickness. Approximately five per cent of the total weight of billets may be ground off with no definite thickness specified. There is more waste in these than in the larger sizes. But, as in all other cases, the object is merely to skin the metal clean. In bloom size stock, usually 8-in. x 8-in. and 11-in. x 10-in., approximately four per cent of the metal is removed.

Only one pass with the grinder is necessary on most of the billet and bloom stock, unless defects show up and demand deeper grinding for removal. The same holds true for slabs, except for the higher alloys which have a very "tight scale."

Crucible uses standard aluminum oxide wheels of No. 14 grit in both hot press and cold press types.

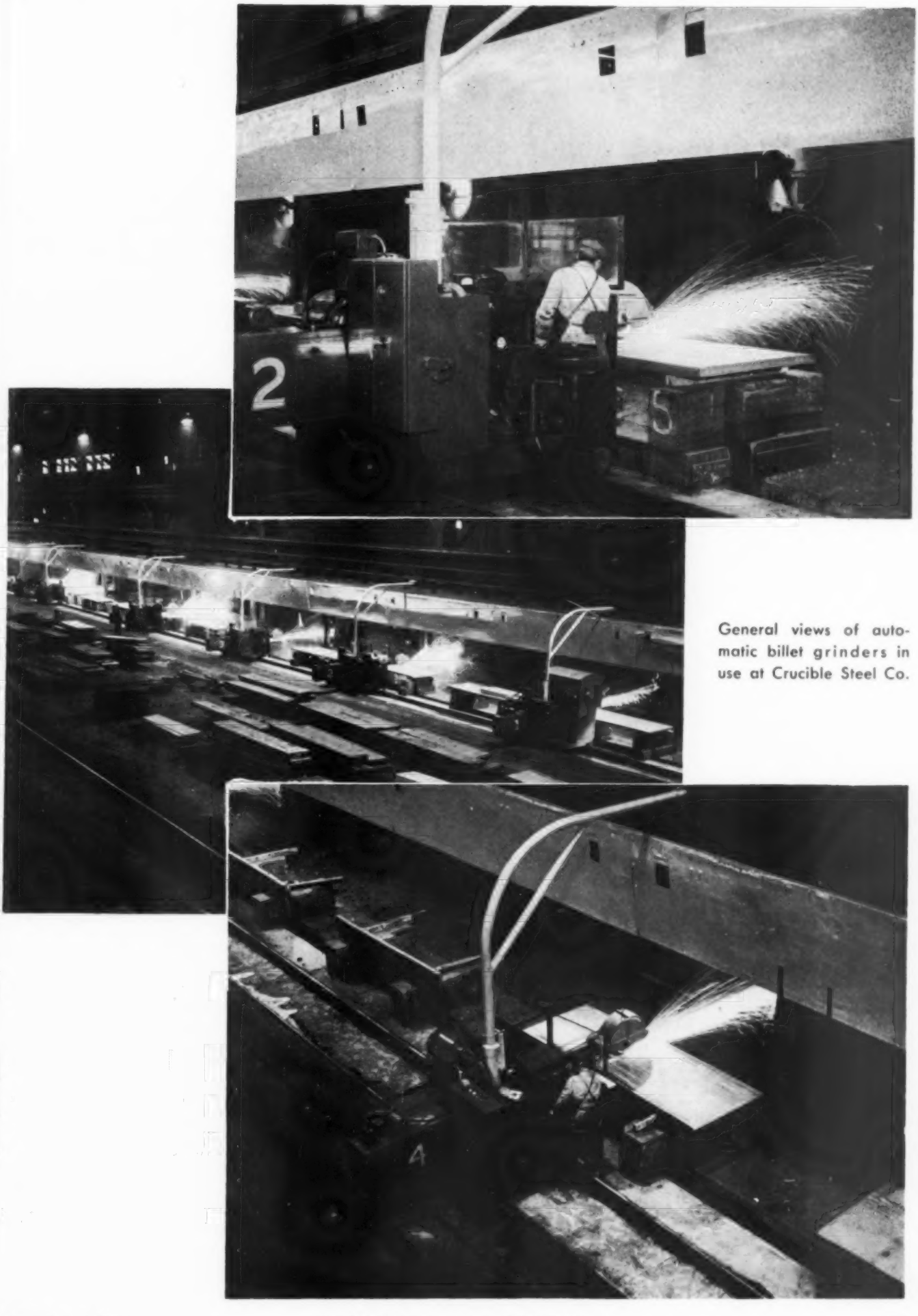
According to Mr. Wm. A. Hulme, Superintendent of the Conditioning Department, better performance and longer wheel life have been obtained from the hot press wheels in the past.

The steel is weighed before and after grinding. This determines the exact amount of metal removed, one major factor in computing

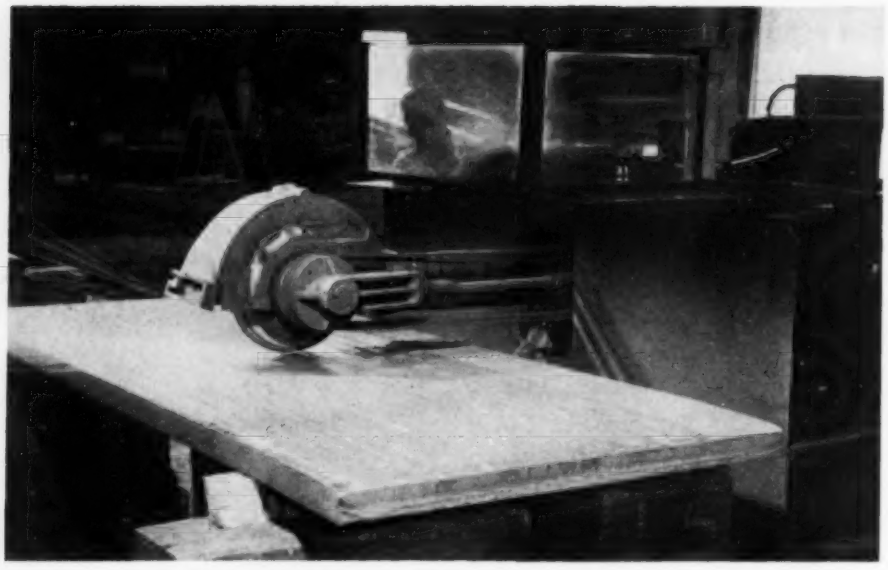


THE GRINDER IS mechanically and hydraulically operated. Its length of travel is limited only by the length of track in which it rides.

The boom on which the spindle and grinding wheel are mounted is hydraulically controlled with a standard maximum feed out of 40-in. and a controlled pull-down pressure to the work. The grinding wheel power is obtained from an electric motor (standard 40 or 60 hp) through a 4-speed transmission allowing for speed changes required due to wheel wear.



General views of automatic billet grinders in use at Crucible Steel Co.



THE GRINDING HEAD can be oscillated a total of 15° for spotting or wheel dressing. This may be automatic or job oscillation. The recommended degrees of oscillation are plus 5°, minus 10°.

Pressures are: boom feed out, 600 lbs., boom pull down (as recommended under safety code), 200 to 450 lbs.

Billet Grinding

(continued)

costs. Contact time is measured on Visutrol units (Stewart Instrument Co., Detroit) installed on each grinding machine. The Visutrols have three signal lights above the operator's cab, visible from one end of the building to the other. An amber light glows when wheel pressure is lessened or removed from the grinding surface. A green light glows when the correct 400 psi operating pressure is applied. A red light glows when the pressure becomes excessive. This arrangement gives the foreman a quick run down on all machines operating in the department at once. If the wrong signal shows for any length of time, the error in grinding technique signals for him to investigate the trouble.

Although the new grinders turn out more than the swing grinders, they are more costly to operate.

Mr. Hulme has determined that the resulting cost per ton of material amounts to a ratio of approximately 5:3, mechanized to swing grinder. This is a net cost ratio reached after considering all factors listed in the test records, plus the cost of operator, crane crew to charge and discharge grinding beds for each machine, maintenance personnel, electricians, supervisory personnel, and all general overhead.

Wheel cost per pound of metal removed has been reduced approximately 60 per cent.

The finish obtained with the mechanized grinders on slabs seems to offer more benefits than that found on blooms in another plant.

The surface of slabs is more uniform and looks better than when they were conditioned by swing grinders. However, more important than this to Crucible, is that pickling and spot grinding on slabs has been eliminated.

When removing minor defects, a swing grinder operator will tend to grind too heavily in local areas. This not only wastes metal, but concentrates the heating effect of the wheel. Uneven expansion from the heat may make the defect increase in size instead of being removed. To prevent this, slabs were heated for swing grinding, the heat partially offsetting the differential between slab temperature and grinding area temperature.

But this heating is unnecessary for mechanized grinding. The new machines give a better distribution of heat from the face of the wheel by making more rapid and smoother passes. There is no local digging or heating as occurs when using a hand-guided wheel.

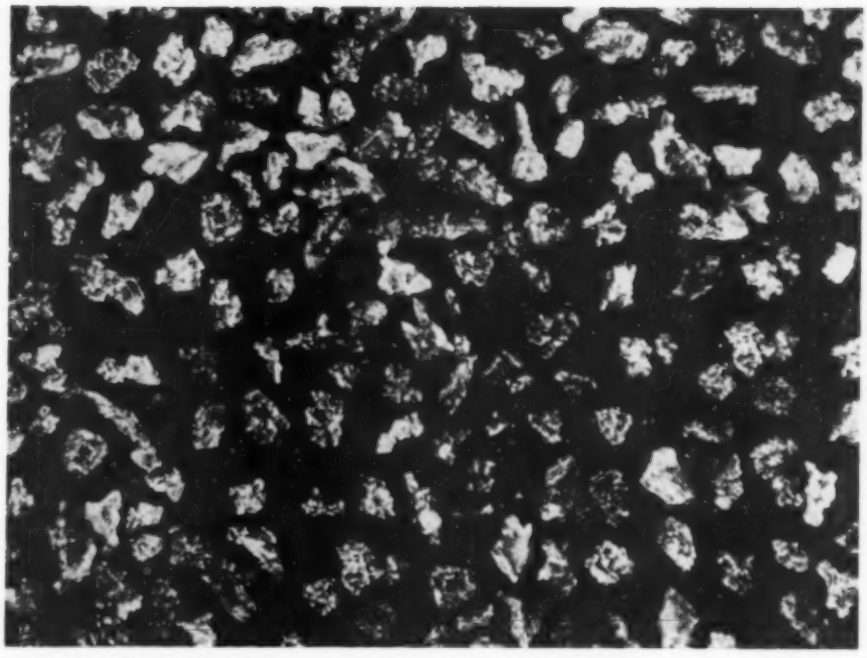
The new grinding machines are controlled by four solenoid valve levers which respond sensitively to the operator's touch, a sharp contrast with the wrestler's approach to the old swing grinders. Since the new machines were installed, absenteeism has dropped to a bare 0.2 per cent.

Grinding contact time has jumped to 70 per cent of elapsed time in a shift.

The wheel is actually grinding metal under full operating pressure and accurate control of the operator for almost three hours out of every four that the operator is on the job. This is considerably better than anything ever accomplished with a swing grinder.

Mechanizing has economized on Crucible's supervision, too. The new machines require only casual observation by the foreman, whereas constant attention from a foreman is required at each swing grinder.

Crucible tested its first mechanized grinder in May, 1954. The company now operates ten. Based on shop experience of the past three or four years, the larger the work piece and the greater the volume of production, the greater is the overall efficiency. • • •



UNDER A MICROSCOPE, man-made industrial diamonds possess real beauty. The diamonds shown in this photograph are of various shapes and colors like natural gem stones.

General Electric announces it has produced

100,000 Carats of Man-Made Diamonds

in its pilot plant in Detroit

- ✓ ***By the end of the year a substantial quantity of man-made diamonds will be in use. Suitable for grinding wheels, lapping compounds and similar applications.***
- ✓ ***Price is approximately $4.25 per carat. Price expected to come down as volume production is attained.***
- ✓ ***Diamonds are made in a matter of minutes.***
- ✓ ***Accomplishment is a 2½ million dollar investment by G-E.***
- ✓ ***Man-made diamonds range in size from 60 mesh down to 600 mesh.***

DETROIT:—Industrial diamonds—made by man and equal in performance to those made by nature—are about to be produced in substantial quantities, it was revealed by the Metallurgical Products Department of General Electric Co.

In less than three years, the Metallurgical Products Department has successfully turned a fundamental discovery into a saleable product. This is an outstanding engineering achievement—probably something of a world's record for taking a basic discovery to market.

Kenneth R. Beardslee, general manager of the Metallurgical Products Department, said more than 100,000 carats of the man-made diamonds already have been produced in pilot-plant operations in Detroit.

Sixty thousand carats of the laboratory-perfected diamonds

Man Made Diamonds

continued

were displayed at a special press conference in which Beardslee and other company officials described science's victory over another technological challenge.

By the end of this year, Beardslee said, a substantial quantity of man-made diamonds, suitable for grinding wheels, lapping compounds and similar applications, will be in industrial use.

These diamonds are made in a matter of minutes.

United States industry this year will import an estimated seven million carats of fragmented bort for industrial use. This is the class of natural material with which General Electric man-made diamonds will be competing. (Bort is made by crushing material that is imperfect for use as single stones.)

KENNETH R. BEARDSLEE, general manager of the Metallurgical Products Department of General Electric Company, directs the group of men bringing the man-made industrial diamonds project to its present pilot-plant stage.

As many as ten million carats have been used in time of national emergency and it is believed industry could consume that amount in peacetime if such diamonds were in plentiful and continuous supply.

Beardslee said it has been proved that production of man-made diamonds is commercially feasible, "and we now have plans for expanding our Diamond Section in 1958."

"That should bring us well along toward our objective of providing a dependable domestic source and thereby freeing this country's industry from the uneasy situation of being forced to depend upon a single source of supply," he asserted.

Although the Government has placed secrecy orders on the patent applications covering the process and apparatus, Beardslee said, the project was accomplished without government money.

"The Government restrictions on patent information come under a wartime law, never rescinded, preventing publication of information which could be helpful to an enemy nation," said John O. Kennedy, Mgr. Diamond Section, General Electric.

This project was accomplished without government money. It represents a 2½ million dollar investment by General Electric in the future of our country and the future of the company. General Electric has financed this project all the way—from the basic research, through equipment and process development to the present pilot-plant facility. The government is not stockpiling the diamonds.

Investigations indicated that man-made diamonds are large enough for most industrial abrasive requirements—they range in size from 60 mesh down through 600 mesh. Translated into more common terms, the size range varies from about the size of coarse sand as used in building mortar, down to a size smaller than a grain of fine white sand such as would be found in a child's play box.

SKILLED SPECIALISTS of the diamond section team await a closer look at the freshly-produced industrial diamonds displayed by Norman L. Leventhal, engineer in charge of new product developments in the diamond section. Seated at the desk is John D. Kennedy, diamond section manager. In the background (from left) are James E. Cheney, process development engineer; John H. McVay, engineer; and William K. Cordier, manager of manufacturing. All played a major role in the development of the man-made diamonds.

In making industrial evaluation, G-E approached those applications which offered the greatest immediate potential for the type of material which it produces: The area of resinoid and vitrified bonded diamond grinding wheels for the finishing of cemented tungsten carbide tools. The Metallurgical Products Department, as manufacturers of Carboloy cemented carbides, is one of the largest single consumers of industrial diamond grinding wheels in this country and consequently provided an excellent place for first actual industrial tests.

In all of this work G-E made every effort to use natural diamonds as a basis for comparison. They started their work in the laboratory with simple lapping tests, lapping carefully prepared specimens of hardened tool steel both with natural diamonds and man-made diamonds. They found that their diamonds performed equally as well as those produced by nature.

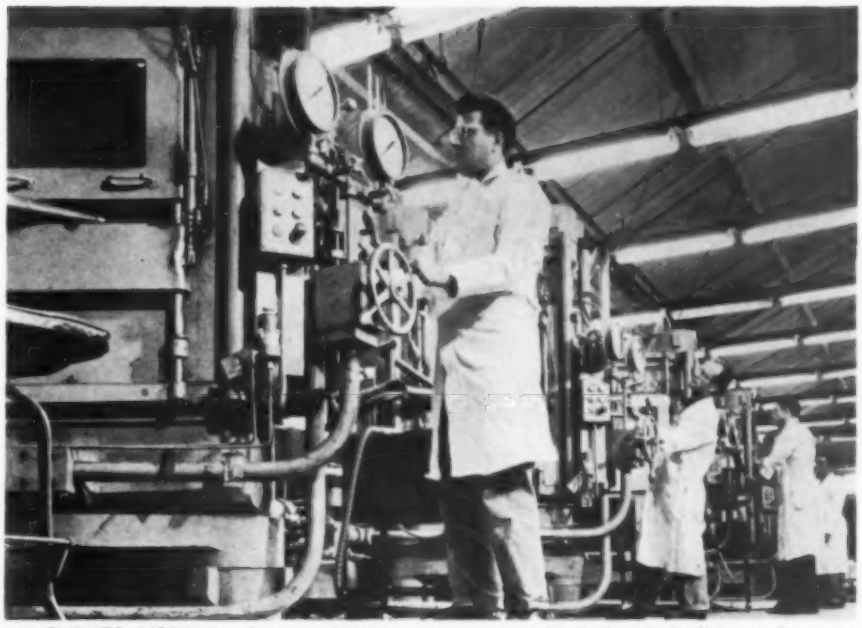
The next step was to experiment with grinding wheels. Since G-E uses both resinoid and vitrified bonded wheels in Detroit and at the Edmore plant, they began with this type of product. The approach was to use both a natural and a man-made diamond wheel at the same time on the same machine under carefully controlled manufacturing conditions. Each of these wheels was tested first in the laboratory and then in actual manufacturing operations.

"Other tests in carefully selected plants have confirmed our results. In most instances the operator using these wheels was unaware of their content," Kennedy said.

"In summary, all our tests have shown that this man-made material performs as well as the natural product in these types of application. This has been a rather extensive program. Similar work has been carried out in the areas of lapping compounds, the finishing of natural diamond wire dies and dental tools. Results were very favorable."

Kennedy said, "The current price of man-made ungraded diamonds is slightly above the cost of ungraded natural diamonds." He pointed out, however, that improved techniques should bring that price down gradually.

At the present time General Electric is selling the diamonds for $4.25 a carat. This is approximately 40% above the price of natural diamonds as sold by the syndicate.



MACHINES USED in the production of man-made industrial diamonds must withstand tremendous "super" pressures and temperatures. Engineers are shown regulating the machines in the diamond section of General Electric's Metallurgical Products Department in Detroit, where the man-made diamonds are being produced.

THE MAN-MADE INDUSTRIAL DIAMONDS being weighed in this picture soon will play a vital role in the nation's industry. Produced by the Metallurgical Products Department of General Electric Co. in Detroit, the thousands of diamonds shown here, about $30,000 worth, will go into grinding wheels. They are equal in every way with those made by nature, laboratory tests reveal.

Grinding and Finishing

Toolroom Grinding

Efficient Tool Sharpening Expedites Tricky Drilling Job

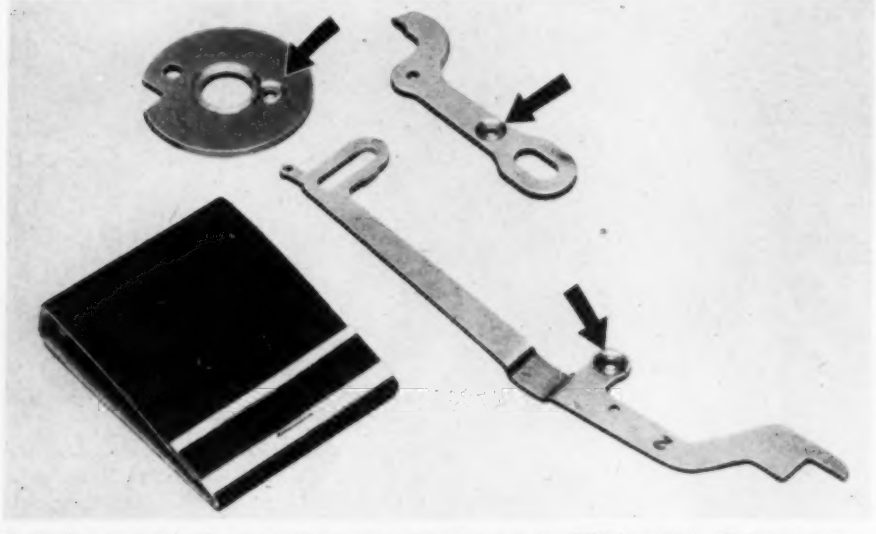
by **William A. Johnson**

Royal Oak Tool & Machine Co.
Royal Oak, Mich.

- ✓ *grinding eliminates burr*
- ✓ *correct delay of from 2 to 4 days when sharpened on outside*
- ✓ *costs are almost cut in half*

● At the Burroughs Plymouth Plant many small stamped parts are produced for business machines. These parts are stamped from cold rolled strip stock. The pieces illustrated, which are typical, are only .050 in. thick. The use of some of these parts requires that they be riveted and that the rivet head not protrude above the elevation of the part. To accommodate the rivet head, the area where the head must recess, is spot faced. This being high production work, it is not practical to bushing guide the cutter that performs the operation. Instead the cutter pilots in the work which at the bottom of the cut is quite thin, leaving minimum bearing surface for guiding the tool.

From experience, the Burroughs people have found that standard twist drills, reground with integral



Typical stamped business machine parts which are only .050-in. thick. To accommodate a rivet head, which must not protrude above the elevation of the part, the area where the head must recess is spot faced. Arrows point to typical rivet holes.

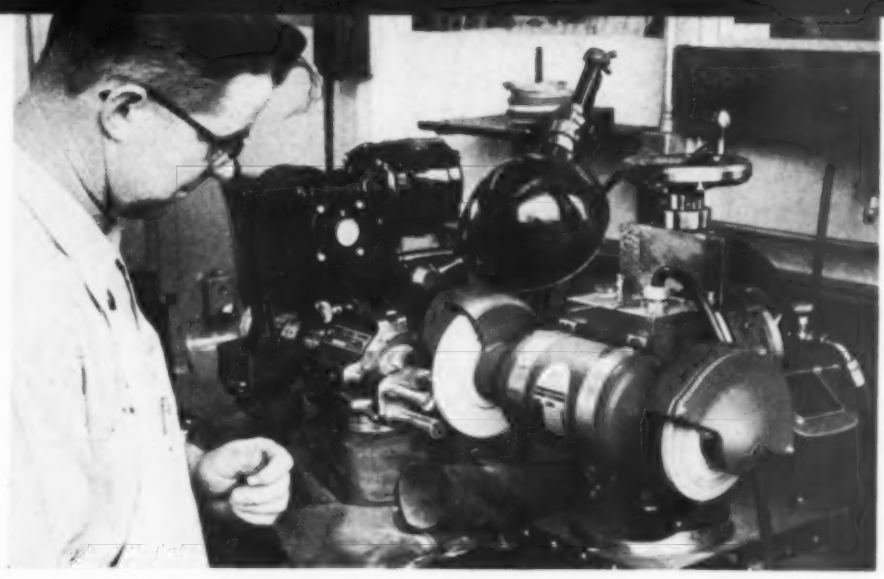
This is the drill used to spot face the rivet holes.

pilots are the most practical tools for this work since many of these jobs also include drilling as well as spot facing and on others, the drill serves to deburr the stamped hole to size as it enters. The use of these drills, however, is possible only because they can be reground without producing an undercut at the intersection of end cutting blade and pilot. With an undercut, the tool would not pilot in the thin stock, but with the pilot ground undersize, would be free to operate off center. Accordingly, the tools are ground in an R-O Universal Form Relieving Fixture and Grinder to preserve the pilot diameter with subsequent resharpenings of the intersecting blade. The R-O grinder is made by Royal Oak Tool & Machine Co.

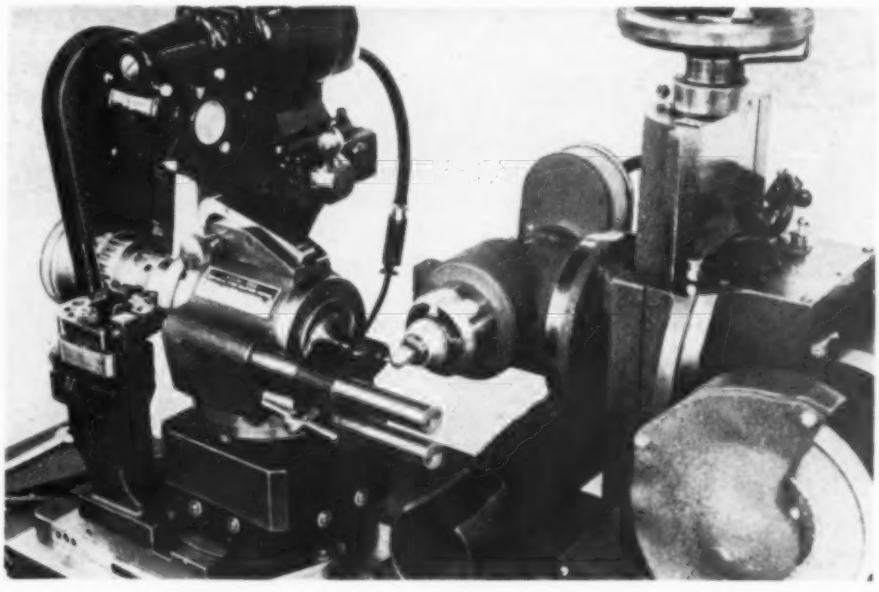
The R-O method of grinding eliminated the burr which was an important advantage to Burroughs; however, this was found to be only secondary in importance to the benefit derived from the ability to grind and maintain the pilot diameter size while form relieving the end cutting portions of the tool.

Formerly, Burroughs sent this tool grinding work outside. This involved delay of from 2 to 4 days which they could not afford.

The problem of forming flat faces on the blades and a relatively sharp corner at the intersection of the blades and pilot is easily overcome by the use of small diameter wheels. Burroughs uses a high speed, 45,000 RPM, R-O internal grinding attachment with a small wheel. This attachment mounts on the back of the grinder column. The installation of the attachment in no way interferes with conventional use of the regular spindle and larger wheels for other work. In the application described here, the column is swung around 90° and the fixture is set for axial motion only, into the wheel, producing end relief of the spot facing blades and finish grinding the pilot to size without relieving it. Burroughs also utilizes the standard guide bars and center bracket of the fixture with a standard A.S.A. drill bushing inserted to obtain complete rigidity of the small diameter tool, under 11/32", while grinding. Larger tools are supported in the standard steady rest which accommodates bushings for drills 7/32-in. to 1⅝-in. This method vir-

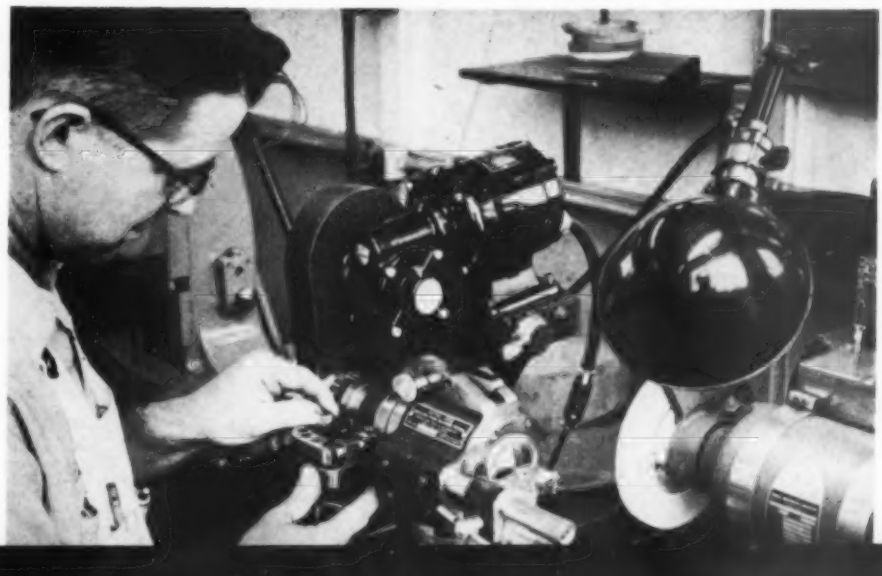


ROUGHING STEP into tool producing pilot. Tool is held in bushing supported by R-O steady rest.



INTERNAL ATTACHMENT is swung 90° for relief of end cutting spotfacing blades. Pilot is finish ground on this operation. There is no undercut at intersection.

FOR PRODUCING COUNTERSINKING TOOLS, large wheel can be used. Pilot and countersinking blade can be finished as one operation. Note carriage is set at proper angle to produce both axial and radial grind. Operator is adjusting bell crank in this instance for minimum drop on two flute drill of .0105".



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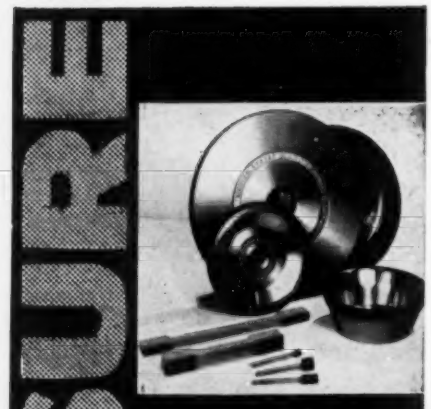

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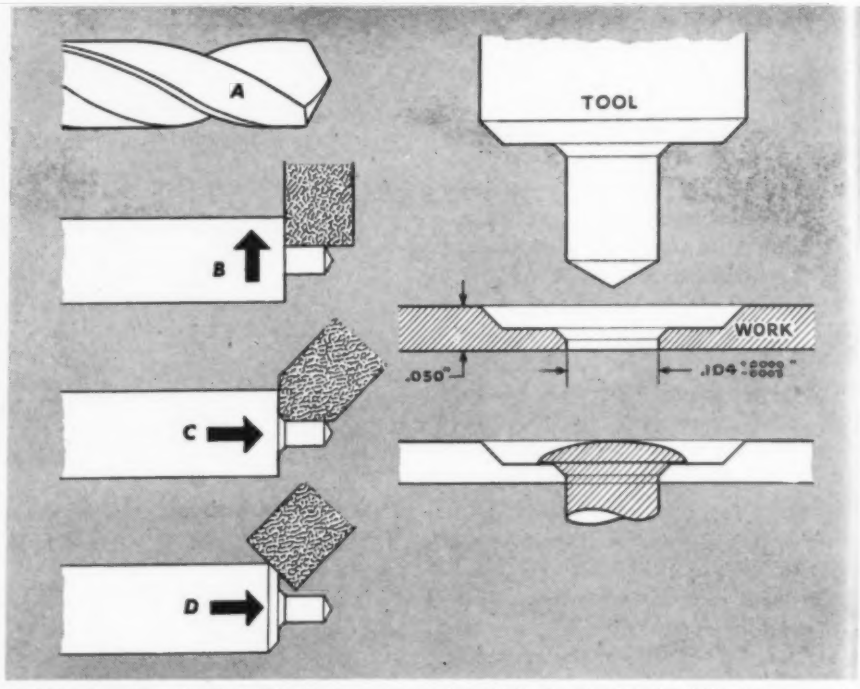

At left, drawings B, C & D indicate manner in which standard twist drill A is ground. Drawings at right show tool and how work is cut for recessing of rivet head.

tually eliminates the problem of chucking trueness and assures concentricity of pilot diameter to the body of the drill since the pilot diameter is generated from the body of the drill supported in its bushing. An added advantage reflected in this method is that the drills may be easily repositioned after removal for checking or repositioned for subsequent grinding operations.

Burroughs, wheel and time cost for producing the subject tool which is but one of many ground is $1.43. The drill is $.42 for a total initial cost of $1.85. Regrinds are less than the $1.43 since it is unnecessary to rough out the pilot. It was not possible to obtain exact prices on work they had formerly purchased on the outside, but Mr. Gascon, Burroughs engineer, indicated it ran as high as $6.00 including the drill. • • •

New American Standard— Identification Code for Diamond Wheel Shapes

The American Standards Association approved the American Standard Identification Code for Diamond Wheel Shapes. Printed copies of this standard, B74.1–1957 have just been made available for distribution to industry.

The Foreword of this publication points out that "The growth of the diamond wheel industry has been rapid. It has also become increasingly complex in that a great diversity of shapes are required to perform operations which had not been considered suitable diamond wheel applications only a few years ago.

"As a result the old system of coding the shape types of diamond wheels had become outmoded and unapplicable. Attempts to work within the system already in most common use and to extend that system met with failure. It was impossible to devise a suitable modification of the old system without the fault that one symbol could mean two or more different things under varying conditions.

"To correct this situation, the committee within the industry studied the problem, determined the necessary characteristics for clear description and established a coding system within that framework. By using the system as listed in this new American Standard, every conceivable shape of diamond wheel can now be typed by the use of the symbols set forth therein."

Single copies of the standard are available free of charge by request on company letterhead from the Grinding Wheel Institute, 2130 Keith Building, Cleveland 15, Ohio.

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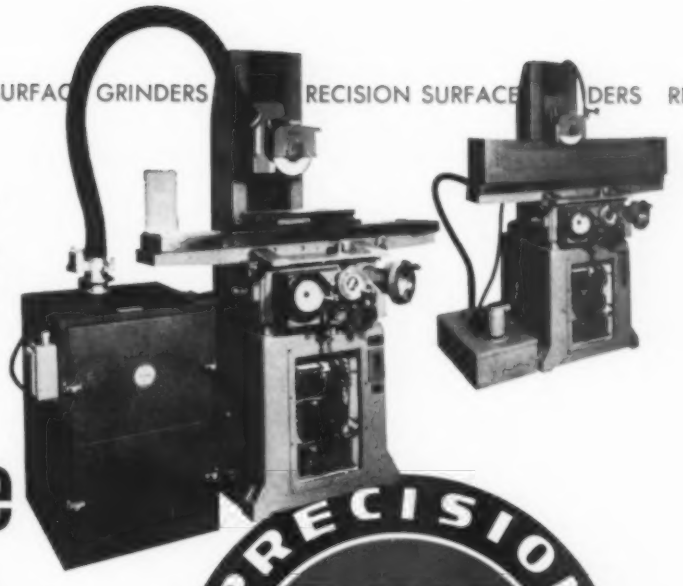

MODEL 618P
(large illustration)
with dust collector,
and (small illustration) with
wet grinding attachment.

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REID . . . the quality name in surface grinders! Choose from three different models in the 618 class; capacity 6″ wide, 18″ long, 17¼″ from spindle center to table. Accessories can be supplied for wet grinding, cool grinding, dust collecting, etc.

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CDP* tools are different—IN ECONOMY

- you use up every point and piece of every diamond particle.
- there is no wastage. CDP* gives the most efficient use of diamond caratage conceivable.
- you eliminate diamond resetting.
- you get more pieces per dressing.
- longer wheel life cuts wheel costs.
- you cut diamond tool costs (see example).

CDP* tools are different—IN PERFORMANCE

- there's a big difference in results (see typical example).
- they even do jobs big single diamonds can't do efficiently.
- they take the guesswork out of diamond performance by insuring *uniform* results, tool after tool.

Yes, CDP* tools are different

- there is no quality variation in CDP* dressing tools.
- it is their design and manufacturing uniformity that gives you such uniform results.

CDP* Cemented diamond particles—small diamond particles set into a matrix which automatically adjusts itself to diamond wear.

A typical wheel dressing example

	Single Diamond	CDP* Dresser
Life	5 days	60 days
pcs/dressing	12	25
cost/100 pcs.	1.7 cents	0.5 cents

(¼ the tool cost per piece, half the wheel cost, less downtime and double the wheel life.)

CDP* tools take the guesswork out of diamond tools and convert them into WORKHORSES OF INDUSTRY. What carbides did for machining, CDP* tools are now doing for grinding.

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Grinding and Finishing

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Transmission Belt

Rusco transmission belts for speeds to 100,000 rpm and over are described in a six-page bulletin. Included are technical data, along with graphs showing results of competitive tests as to belt life and elongation.

The Russell Mfg. Co., 529 East Main St., Middletown, Conn.

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Rock Drill Bit Grinding Wheel

Many questions are raised such as when to grind, how to grind and how to best select grinding wheels for grinding rock drill bits are encountered in percussion and rotary rock drill bit grinding. These problems are dealt with in a six-page brochure. In addition, general recommended specifications for machine grinding rock drill bits are given.

Bay State Abrasive Products Co., Westboro, Mass.

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Blast Cleaning Machines

"Special Cleaning Problems Solved," a 34-page brochure, shows by photographs and schematic drawings how airless blast cleaning, air blast cleaning and wet blast cleaning have been employed in specific applications. Experiences of more than 50 companies in producing a better product are given.

Wheelabrator Corp., 1169 S. Byrkit, Mishawaka, Ind.

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Universal Grinders

The Landis 14" and 18" Type CH Universal Grinders are pictured and described in a new 24-page catalog. Microsphere wheel spindle bearings assure quick sparkout and accurate response to wheel feed. The eye level wheel feed speeds grinding and set-ups as operator does not have to move about so much. The hydraulic operation traverses the carriage smoothly and evenly at variable speeds for accurate finishes. Pictures and sketches as well as specifications are included.

Landis Tool Co., Waynesboro, Pa.

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DusKolector and MistKolector Machines

The new Hammond DusKolector and MistKolector catalog, No. 815, is now available. The outstanding feature of the DusKolector units is they can be used with dirt and mist producing machines that are located too far away to be connected to a central collecting system. The MistKolector units, available in two models and four motor sizes, are valuable for collecting fog and mist created by wet grinding and machining operations.

Hammond Machinery Builders, Inc., 1651 Douglas Ave., Kalamazoo, Mich.

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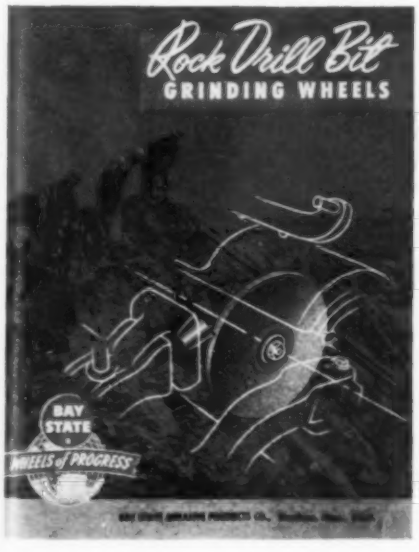

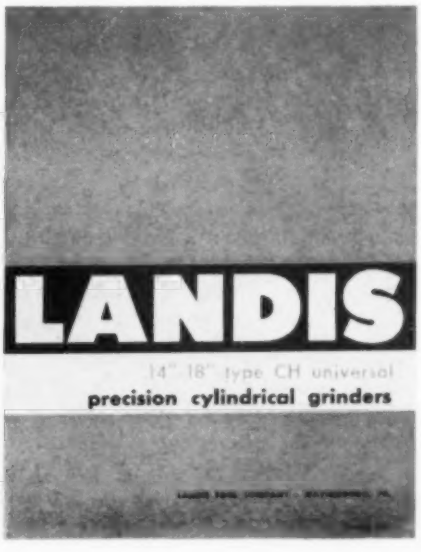

FREE LITERATURE *continued*

Dust Collectors

The economies of dust control are possible in reduced capital expenditure, operating time and machine operating costs, as well as an increase in employee efficiency, with Torit-designed unitized dust collectors. On-the-job photographs and application stories are used in the booklet, "How Much Are You Paying for Dust?" This demonstrates typical installations of both cabinet cloth filter dust collectors and cyclone separator type collectors.

Torit Manufacturing Company, Dept. KP-5, Walnut & Exchange Sts., St. Paul, Minn. •

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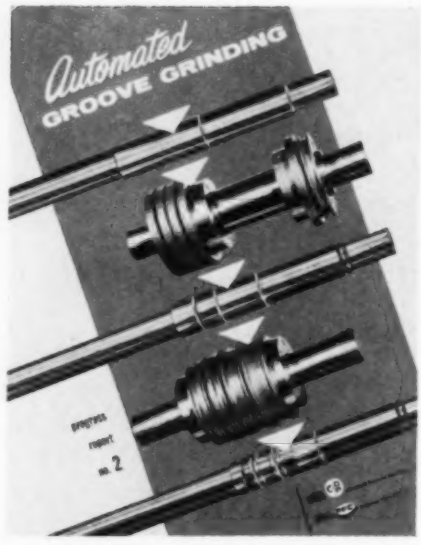

Progress Report on Perpetual Form Control

The second progress report on the new perpetual form control for grinding wheel dressing is now completed. Here is a development which is said to eliminate all down time for wheel dressing, makes possible complete automation of grinding operations, and permits forming a resinoid wheel, among other benefits. Freer and faster cutting action of the grinding wheel is obtained. Text features are informal question and answer discussion of the process, plus examples of narrow dimensional limit groove grinding on an automated basis.

Jones & Lamson Machine Co., 520 Clinton St., Springfield, Vt.

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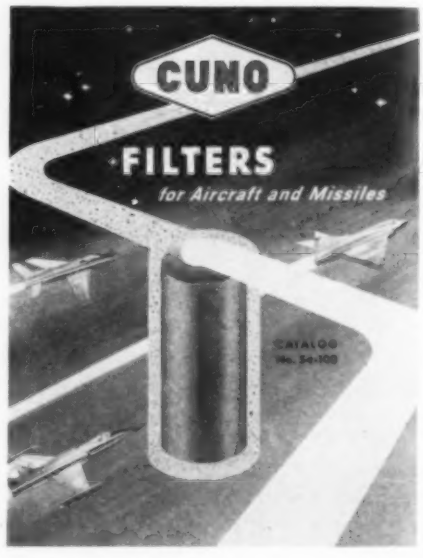

Filters for Aircraft and Missiles

Poro-Klean filter units for airborne applications are described in Catalogs Nos. 54-100 and 54-101. Filter cartridges are listed in No. 53-100. Today's higher, faster flights have introduced new filtration problems that have obsoleted older filtering methods and media. Micro-mechanical filters give high heat and corrosion resistance, great tensile strength to resist high differential pressures, very fine filtration, and complete elimination of element discharge.

Combining two types of filtration in a single unit—that of a relatively coarse medium to remove contaminants like particles from bronze bearings, and a fine filter in the range of 3 microns or smaller capable of removing sub micronic iron particles—is the micro-magnetic filters.

Cuno Engineering Corp., South Vine Street, Meriden, Conn.

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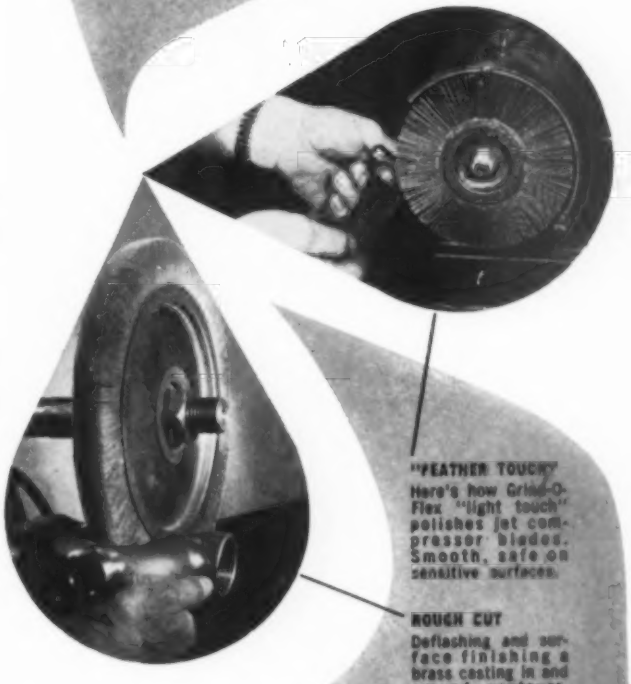

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Here's how Grind-O-Flex "light touch" polishes jet compressor blades. Smooth, safe on sensitive surfaces.

ROUGH CUT
Deflashing and surface finishing a brass casting in and around contours. Fast! Thorough!

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New, high durability design — an extremely rugged wheel capable of operating at higher RPM's (up to 5500 where required)

More abrasive per wheel — longer abrasive flaps for longer life, more resilience, faster cutting.

Grind-O-Flex wheels are available in 3" to big 18" diameters for automatics, widths up to 6". Grind-O-Flex wheels shape themselves to the job — get in and around complex contours and hard-to-reach places . . . will not "flat" or dig . . . fits any rotating spindle. There's a grit, diameter and width to fit your every polish or grind requirement.

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Perfectly balanced, easy to handle—because it's an angle tool . . . gearless efficiency and direct air-flow because it's a vertical tool.

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It's also the busiest abrasive tool you'll ever have in your plant—because it's the NEW Buckeye "E" Series Vertical-Angle Grinder-Sander, fully described in our Catalog A-10. May we send you your copy?

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FREE LITERATURE *continued*

Dry Honer

"Self-Contained Dry Honer" is a folder recently released. First proven honing machine to suspend its abrasive or blasting powder entirely in an air stream, 100% free of water or other liquids, Vacu-Blast dry honer is said to offer industry far more for its metal-working dollars. It is self-contained, completely portable, and adaptable to your needs. A design feature is the "waffle floor," which increases blasting efficiency by providing true downdraft ventilation in the inner work area.

Vacu-Blast Co., Inc., P.O. Box 855, Belmont, Calif.

Use postpaid card. Circle No. 9

Maintenance Tips for Unit Heaters

Four pages of valuable tips on what to do and what not to do in installing and caring for unit heating equipment are given in a new illustrated bulletin No. 12, "Care and Maintenance of Steam and Hot Water Unit Heaters," published by the Air Moving and Conditioning Association.

Pointers on installation include such topics as: Low pressure gravity systems; vacuum systems; high pressure systems; branches from steam supply mains; strainers. Recommended maintenance procedures cover motors, heating elements, fans, casings, traps and check valves, and special considerations for forced water and blower type unit heaters.

Air Moving and Conditioning Association, 2159 Guardian Building, Detroit 26, Mich.

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World Renowned
COATED ABRASIVES

The Difference Saves You
TIME and MONEY

Now the famous HERMES coated abrasives are available to the discriminating U. S. market. There is a difference — HERMES products are precision fabricated in a wide variety of sizes and types to do each job best and last longer. HERMES quality has been internationally known for over 30 years.

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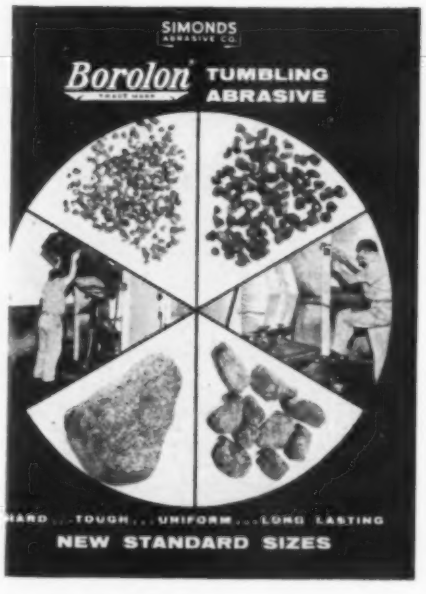
Tumbling Abrasive

Just issued is a new catalog bulletin, Form ESA-236, describing Borolon tumbling abrasive for barrel finishing. This material is aluminum oxide abrasive in chips and screened grain sizes for a wide range of use.

New sizing standards for chips are described, which provide more sizes than previously available and more accurately controlled.



Simonds Abrasive Co., Tacony and Fraley Sts., Phila. 37, Pa.

Use postpaid card. Circle No. 11

Coated Abrasives

Whether you are involved in sanding, grinding or polishing operations in a factory, or a do-it-yourself project in the home workshop, there are precautions to observe in the use of coated abrasives. The dangers involved in their use, according to the National Safety Council, come from dust and fumes, flying particles, breakage of belts and discs, fire and explosion, or personal contact.

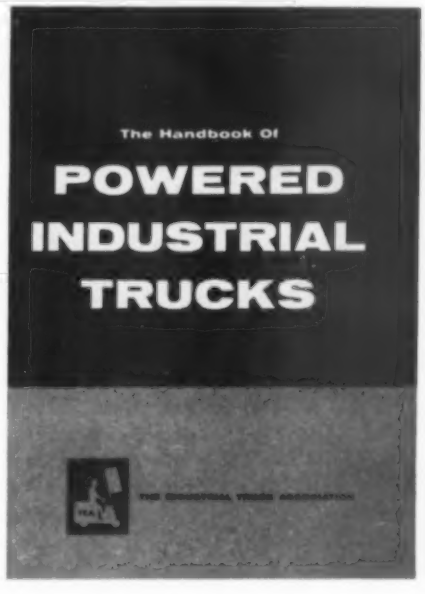
The safe use of abrasives is discussed in Data Sheet D-452, "Coated Abrasives." Prepared and reviewed by safety engineers, all experts in the field, it is one of several published periodically by the Council.

National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Use postpaid card. Circle No. 12

Powered Industrial Trucks

The purpose of this handbook is to examine the role of the industrial truck-unit load system as it applies to the science of material handling. It is believed to be the most complete and authoritative source of material on this subject, ever presented in a single publication.



That material handling is of vital importance to all of American business is today an accepted axiom. In certain industries, warehousing for example, material handling constitutes 100% of the physical activity. Accordingly the efficiency of such a system could mean

the difference between the continued success or failure of the company itself.

In general manufacturing operations as well, the cost of handling material may range from 25% to 90% of total production costs. Here again, the effectiveness of material handling operations could mean the difference between profit and loss on a given finished product.

The purpose of the handbook is three-fold: (1) to give as complete a picture as possible of the role of industrial trucks; (2) to give such information that will enable a company to select that type truck best suited to a given operation or operations; and (3) to enable a company to best utilize such equipment.

The Industrial Truck Association, 900 F Street, N.W., Washington 4, D.C.

Use postpaid card. Circle No. 13

Air Control Equipment

Perfecting Service Co., 332 Atando Ave., Charlotte 6, N.C., announces Bulletin No. 80 describing their line of universal air control equipment. The 12-page catalog shows their regulator-filter-lube combination, air regulators, air lubricators, air filters, filter-lubricators, regulator-filters, air dehumidifier-filters, automatic drain traps and filter traps. Accessory equipment for use with this and other air line equipment is shown. Included in the accessories is a line of 'pushomatic' couplings. Applications and specifications are listed for the many items.

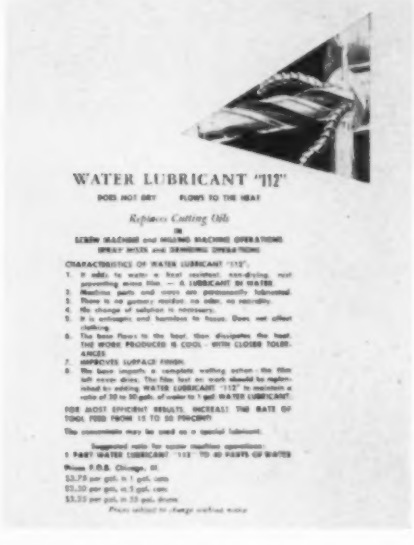
Use postpaid card. Circle No. 14

Jones & Lamson Catalog

In the recently published catalog put out by Jones & Lamson are the ram and saddle type turret lathes, said to be built and powered to produce more chips per tool, more pieces per hour, more profit per job. A complete line of thread tools and accessories are listed also. The Faymatic Model 40 tracer, as well as 8″ Fay and 16″ Fay automatic lathes are described. Among others described and pictured are thread and form grinders, optical comparators, and precise boring machine.

Jones & Lamson Machine Co., 520 Clinton St., Springfield, Vermont.

Use postpaid card. Circle No. 15



Water Lubricant

Water Lubricant "112" does not dry and flows to the heat, dissipating it. This lubricant replaces cutting oils in screw machine and milling machine operations, spray mists and grinding

Don Oberg tells why the Moore Jig Grinder is an absolute must in any good die shop

by **DON E. OBERG**
General Manager
Oberg Manufacturing Co., Inc.
Tarentum, Pa.
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"One of the most important features of an Oberg-built die is guaranteed complete and positive interchangeability of parts throughout the life of the die. *This feature would be practically impossible without the application of Moore Jig Grinders.*

"With Moore Jig Grinders we can accurately locate holes with relation to each other as well as size holes to extreme accuracies. We can efficiently grind contours on carbide die sections which would be impractical by almost any other method. Back taper on contoured carbide die sections and piercing holes can be readily generated on Moore Jig Grinders.

"We feel it would be *practically impossible* to produce the high precision carbide dies required by industry today without the Moore Jig Grinder. *In our opinion it is an absolute must in any better-than-average die shop.*"

As Mr. Oberg points out, the Moore Jig Grinder has no equal on many essential toolroom operations. If you would like a bulletin describing some of the features that make this machine so outstanding, just drop us a line.

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725 Union Avenue, Bridgeport 7, Connecticut

"The things we like best about our four Moore Jig Grinders are the sturdiness and dependable long-life accuracy built into them. Ours are used ten hours or more every day. Even with this high activity, we have found no apparent inaccuracies from our oldest to our newest machine."

HOLES, CONTOURS AND SURFACES, Moore's authoritative book, tells how to produce tools, dies and precision parts *the modern way*. 424 pages, 495 illustrations. $5 in U. S. A., $6 elsewhere.

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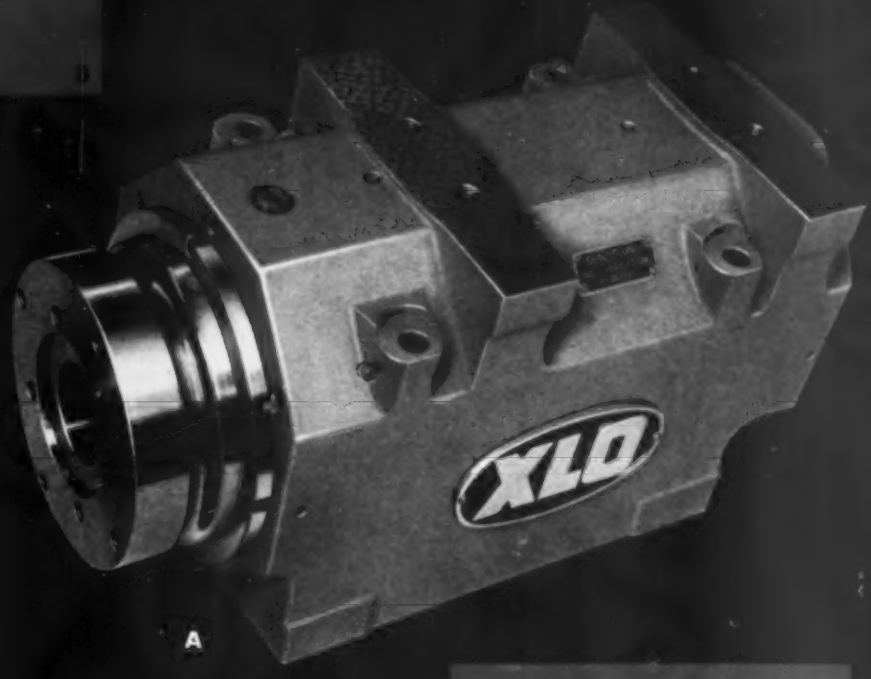

A

D

F

A. Standard DB 24 Spindle
B. DB 50 Motorized Spindle
C. DB 25 Square Body Spindle
D. DB 50 Motorized Quill-Type Spindle
E. DB 22 Square Body Spindle
F. Standard DB 22 Spindle

E

57-90

Greater Accuracy—with Ex-Cell-O Precision Boring Spindles

No one need tell you of the proven superiority of Ex-Cell-O precision boring spindles where close tolerances and fine finishes are required. But, did you know that these same Ex-Cell-O boring spindles have been used as replacement units for years?

Produced in belt-driven, standard motorized, or high frequency motorized styles, these Ex-Cell-O precision spindles are equipped with XLO Precision bearings for maximum spindle rigidity, long life and smooth operation. Permanent bearing lubrication reduces maintenance costs, prolongs bearing life.

For complete information, why not get in touch with your local Ex-Cell-O representative or, if you prefer, send direct for bulletin 25477.

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REASONS *why*

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ultra-speed

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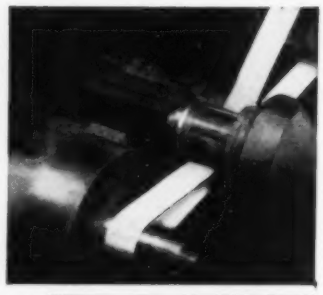
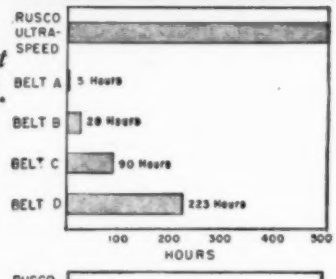
1. ***ultra-speed*** ***belts operate at higher speeds and over smaller diameter pulleys.***

Engineered for all speeds to 100,000 rpm and over, Rusco ULTRA-SPEED belts withstand the severe flexing action of small diameter pulleys. In fact, ULTRA-SPEED can be used over smaller pulleys than any other type of flat transmission belt.



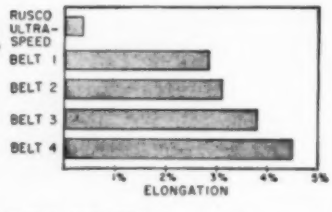
2. ***ultra-speed*** ***belts outlast all other flat belts at ANY OPERATING SPEED.***

Competitive belts failed on a 30,000 rpm drive as shown, while the ULTRA-SPEED belt was removed in perfect condition after 516 hours of operation. Here's proof of real in-service economy.



3. ***ultra-speed*** ***belts are stretch resistant.***

By test, Rusco ULTRA-SPEED belts stretch as little as ½ of 1%—⅙ as much as the closest competitive belt. Take-up requirements are far less. More positive traction is assured.



Prove the superiority of Rusco ULTRA-SPEED on your most difficult drive. If it does not outlast any other type of flat high speed belt you've ever used, your full purchase price will be refunded.

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. . . the flat high speed transmission belt that outlasts all others—regardless of operating speed or minimum pulley diameter.

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operations. It adds to water a heat resistant, non-drying, rust preventing micro film. There is no gummy residue, and the lubricant is antiseptic and harmless.

Brochure from Scientific Abrasives, 5100 North Canfield Rd., Chicago 31, Ill.

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1,687

REASONS WHY

YOU AND YOUR COMPANY SHOULD SUPPORT THE AMERICAN STANDARDS ASSOCIATION

American Standards Association

The American Standards Association is the national coordinating body and clearinghouse for voluntary engineering, industrial, and consumer standards. A specific instance of its importance is that it would cost an individual company perhaps $500,000 to develop two standards that it can buy from the ASA for $4.50. Points stressed in the 32-page booklet, "1687 Reasons Why You and Your Company Should Support the American Standards Association," are more American Standards would save the company more money, lack of these Standards is costing the company money, and American Standards make it easier to do business with the government.

American Standards Association, 70 East 45 St., New York 17, N.Y. •

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Wheel Approach Control

A four-page bulletin shows how the new wheel approach control speeds the grinding cycle on new Landis cylindrical grinders when work with large variations in stock have to be ground.

Landis Tool Co., Waynesboro, Pa.

Use postpaid card. Circle No. 18

On-the-Job Report: Grinding Machine Ways

Work pieces consist of machine ways used by Baldwin-Lima-Hamilton Corp. in their machines. They are 40-13/16 x 4 x 1½, all four sides ground. They are made of Simonds No. 51 steel which has the following formula C-1%; Si-.40%; Mn-.65%; Cr-5.25%; V-.25%; Mo-1%.

This steel is equivalent to Vanadium Alloys "Air Hard," Universal Cyclops "Sparta" and Latrobe Steels "Select B."

Steel is hardened to 50-55 C Rockwell before grinding.

The wheel used is a Simonds WA46-G8-VI, 20 x 4 x 8, recessed two sides 11¼ x ½, type 7.

Machine used is a Thompson hydraulic surface grinder Model C with a 16 x 16 x 96 table. It has a horizontal spindle and table. Grinding wheel speed is 1200 RPM. Feed is automatic and takes place at the end of each complete traverse stroke. The table has a traverse speed of 72 ft./min. and the grinding wheel traverses at a speed of 8 ft./min. The infeed is .001-in. per stroke. Dressing is done as required with a single point diamond tool.

The wheel is balanced before mounting on machine by means of balancing weights in the flange. Flanges are 12½-in. diameter and are relieved.

Coolant is White & Bagley No. 1500. This is mixed with water at the rate of 100 parts of water to one part of oil. No special filters are used—just the settling tank on the machine.

Ways are ground three at a time with a unit overall grinding time of 17 minutes for grinding the flats (the 4-in. side) and an overall time of 15 minutes for the edges (the 1½-in. side). Contact time is 6 minutes per side for the flats and 5 minutes per side for the edges. Total stock removed is .010-in. per side on the flats and .035-in. on the edges, giving a total of approximately 7.4 cubic inches removed per piece.

Three pieces are ground per dressing, since it is necessary to dress the wheel each time before the finish passes.

No estimate has been made for total number of pieces per wheel as the machine is used for other grinding operations between lots of this work. A 20 RMS finish is obtained and all sides must be within .001-in. for size and parallelism.

The edges of the ways are ground first and because the magnetic chuck might pull them down unevenly they are mounted by means of three centering pins and Vee blocks. After the sides are ground to size and finish the flats are ground on the regular table. The larger area of the flats makes it unnecessary to use the centering pins and V block. A final operation is chamfering all corners to a 3/32-in. flat. This is done by using a special 45° fixture mounted on the regular magnetic chuck. • • •

Improved Lusol..

A BETTER PRODUCTION METHOD

Improved Lusol, an oil-free transparent water-soluble solution, will give superior performance in a wide variety of grinding operations. The combination of lubricity and maximum cooling make Lusol especially indicated for Centerless Grinders where a fine low micro inch finish is required.

PROOF THAT LUSOL MEANS LOWER COSTS— BETTER RESULTS

THE WORK: Grinding seals for jet engines on Heald Rotary Grinder. **MATERIAL:** Chrome and S.A.E. 8740 Stainless Steel. **CUTTING SPEED:** 1800 R.P.M. **DILUTION:** Lusol 30-1, former coolant 20-1. **COST PER GALLON IN MACHINE:** Lusol 6½¢, former coolant 8¢. **PIECES PER DRESSING:** Lusol, 20; former coolant 15. And Lusol made possible a 5 micro finish which could not be achieved with the former coolant.

Send for 16-page descriptive booklet.

Lusol.. BETTER PRODUCTS FOR BETTER METALWORKING

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HOLES JIG GROUND with *Vulcanaire*

Provide yourself with this inexpensive* instrument for use on your present equipment and JIG GRIND with a guarantee.

A five station indexing fixture from Vulcan's Contract Tool Room (Your tool room in Dayton).

Using a jig borer index table with the Vulcanaire 5 indexing holes and 35 locating and clamping holes were JIG GROUND in place. Result — eliminated all close locating and dowelling of individual parts and of course hours of time.

*Vulcanaire equipment pays for itself on the first job.

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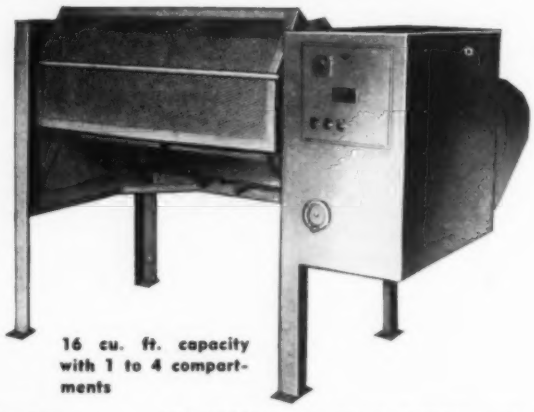
NEW HEAVY-DUTY BARREL FINISHING MACHINE SPEEDS PARTS OUTPUT



16 cu. ft. capacity with 1 to 4 compartments

FEATURES

- Direct belt and gear drive without chains and sprockets. Variable speed 8 to 25 rpm.
- Interchangeable barrels to fit any desired compartment make-up.
- Rugged, heavy-duty construction; No-Seam Vinyl-lined barrels.

USE MODEL V-16. Speed finishing work. Cut parts handling costs on small lots or continuous runs. Select individual barrel sizes to fit any desired combination of compartments. The V-16 Precision Barrel Finishing machine has many versatile features to meet your specific needs, assuring maximum output at lower cost. Engineering design is outstanding.

FULL DETAILS are available in new catalog data sheet "V-16". Write for your copy today.

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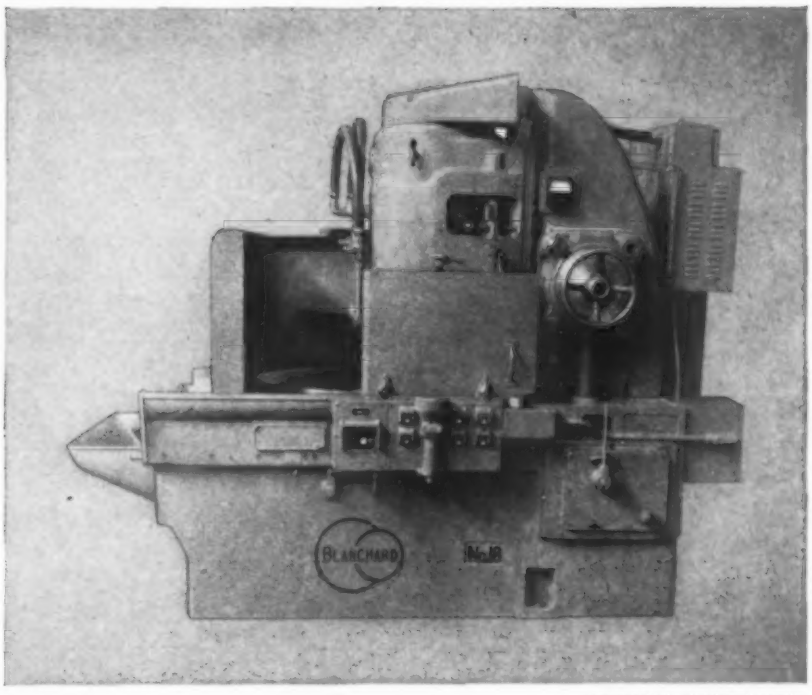
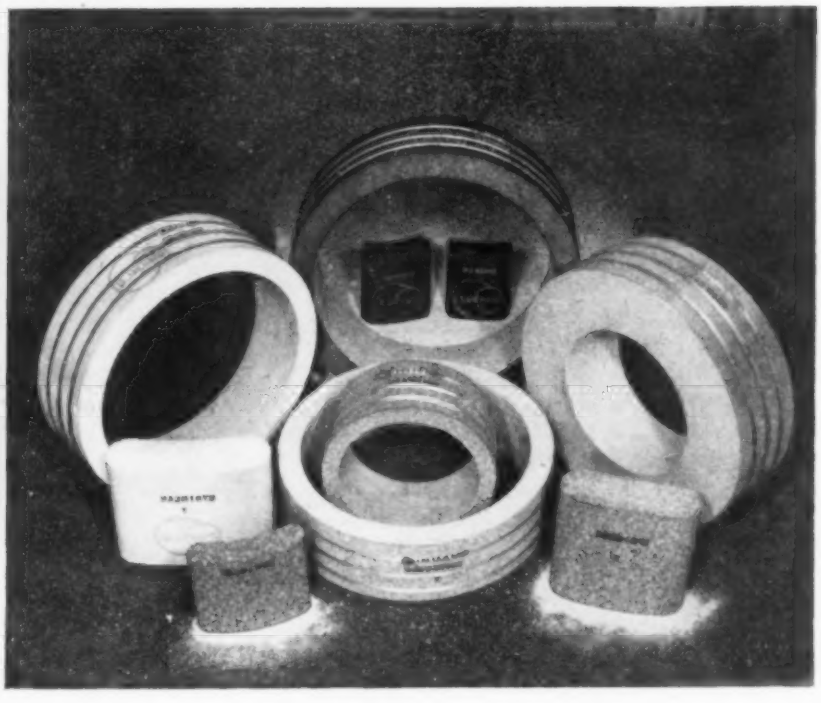
For best results from your Blanchard Surface Grinder



BLANCHARD NO. 18 SURFACE GRINDER

Use Blanchard Wheels!



Blanchard specializes in the manufacture of segments and cylinder wheels for Blanchard and other Vertical Spindle Surface Grinders. If you have a difficult grinding job, whatever the material may be, or if you are not satisfied with the results you are now getting, let us help you.

Blanchard wheels are the quality wheels for Blanchard Grinding. Use them to get maximum performance *from your Blanchard!*

PUT IT ON THE BLANCHARD

Please send me a free copy of "The Art of Blanchard Surface Grinding" (3rd Edition).

THE BLANCHARD MACHINE COMPANY

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THE OLD GRIND GOT YOUR GOAT?

Butt definitely, a good way to meet grinding-wheel problems is . . . head-on. Take your goat by the horn and switch to CINCINNATI (PD)° WHEELS.

They offer Positive Duplication—a remarkable achievement in precision manufacturing and quality control that can save you money . . . and increase your production.

You don't need a long gray beard to wise up to (PD) WHEELS. Through the CINCINNATI (PD) Manufacturing Process you are assured Positive Duplication of the original wheel every time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

Yet CINCINNATI (PD) WHEELS are priced no higher than ordinary wheels.

Grinding problems will never again get your goat, if you see your Cincinnati Grinding Wheels Distributor. He'll be glad to explain how (PD) WHEELS can save you money and increase production. Or, contact us direct and we'll send one of our representatives—men who know grinding and grinding machines as well as grinding wheels. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

Remember—only CINCINNATI Grinding wheels give you

(PD) POSITIVE DUPLICATION

CINCINNATI° *Grinding Wheels*

A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

Trade Mark Reg. U.S. Pat. Off.

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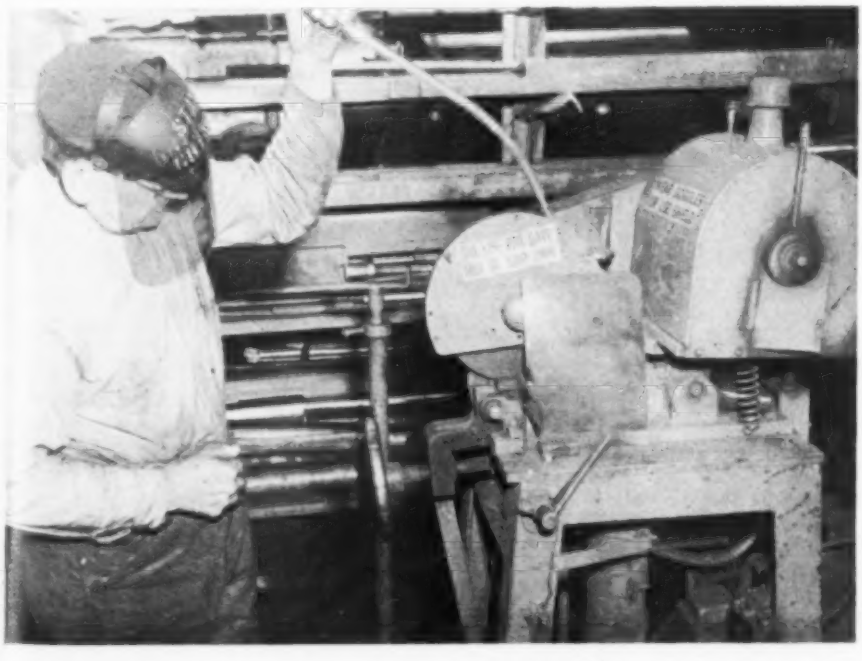
WRONG: Chopper type abrasive cutting off machine shown improperly used. Operator has no goggles. Work is not locked securely in place. Operator is approaching the downstroke timidly. Too slow a downfeed with too light a pressure causes the abrasive to glaze and discolor the work. Too heavy a pressure causes the abrasive grains to bed too deeply in the work and be torn from the wheel before they have performed their cutting action. High speed cutting off wheels like this are invariably well guarded, and even in the event of wheel breakage there is little hazard for the operator.

GRINDING safely

by **Edmund Mottershead**

Abrasive cutting is almost as universally known as grinding in its more conventional forms, and production abrasive cutting of nonmetallics has gone to great lengths and precision. Abrasive cutting by hand, however, as shown on these pages, is still far from a precision operation in the sense that things are so automatic that nothing is left for the skill of the operator. Safety here depends upon the rigidity of the machine, condition of the grinding wheel, how well the work is fastened down in the holding fixture, and the character of the work being cut. All these factors determine, for the skilled operator, how fast and how heavily he will feed the wheel into the work. The use of high speed thin abrasive cutting off wheels on other than specific grinding equipment is not recommended as being generally unsafe and resulting in poor work.



RIGHT: Skilled cut-off grinder operator wears face shield, has piece to be cut fastened securely with work holding mechanism. Thin abrasive wheels such as this should not be used except when installed in the proper machine, as shown. The use of abrasive wheels for cutting off on a circular saw table or other makeshift device increases the hazard of their operation very greatly. Speed of the wheels is usually high, and flanges on saw table spindles are inadequate for this abuse. Provision for endplay in the shaft is seldom good enough for the requirements of abrasive cutting, and the means of controlling the plane of work traverse is poor. Modern high speed cutting off machines, in contrast, are quite safe in the hands of a skilled operator who knows from the sound and feel of the work how much pressure to use on his downfeed.

Arter Rotary Surface Grinders are scientifically designed to provide extremely smooth, remarkably accurate micro-plane surface finishes. The basic feature responsible for these close tolerance, superior finishes is the relation of the grinding wheel to the work. With Arter machines, the grinding is done on the peripheral or outer edge of the wheel while the work is held on a rotating magnetic chuck. This results in extremely fine, concentric finishes so necessary for most component parts used in industry today.

SMOOTH and PRECISE!

For Better Surface Finishes...
It's Smarter to Use...

ARTER

ROTARY SURFACE GRINDERS

Illustrated above is Model E, one of a complete line of Arter Precision Rotary Grinders available in chuck sizes from 8" to 40". Each Arter Grinder features completely automatic grinding cycle . . . building block design for ease of maintenance . . . rigid vibration free construction . . . hydraulic controls . . . variable stepless speeds for both chuck and wheel slide traverse . . . manual and automatic feeds . . . adjustable worktable for concave and convex grinding . . . rotatable magnetic chucks . . . and centralized push-button control panel.

For complete details on Arter Rotary Surface Grinders call your Arter representative or write for free brochure.

ARTER

ARTER GRINDING MACHINE COMPANY

Manufacturers of
Rotary Surface, Internal, External Grinders and
Arter **JIGMATIC** *Positioning Table*

15 SAGAMORE ROAD, WORCESTER 5, MASSACHUSETTS

Grinding and Finishing

New Equipment and Materials

For further information on any of the products listed here, use the handy postpaid card opposite page 64.

Tungsten Carbide Dresser

A Chicago fabricator of plastic windshields for pleasure boats smoothed the edges of 3,500 windshields over a period of seven months with a single Skil Perma-Grit T-C abrasive disc. Formerly, the company sanded only 30 windshields per single sandpaper disc.

Perma-Grits are fabricated by brazing tungsten-carbide grits on steel. The grits are fixed in rigid position permanently, which keeps them sharp for an indefinite period. If they become gummed or clogged under long-time use they can be restored to efficiency with a solvent and/or wire brush.

The cost savings offered by the abrasives is attested by a Chicago manufacutrer of plastic windshields for pleasure boats, who reports he sanded the edges of more than 3500 windshields with one Skil abrasive plate on a disc sander. Formerly he was able to sand only 30 windshields with a conventional disc.

Another manufacturer of molded products reports: "Production costs with your abrasive plate is about one-sixth the cost of discs formerly used. Furthermore, quality of work is more uniform than previously attained and we have enjoyed a higher production rate."

From the abrasives, the manufacturer has fashioned rods and sleeves for contour sanding; a hand sander and file; sheets, plates and discs for portable and stationary sanders, and saw and sanding wheels. The Perma-Grit saw wheel, in effect a circular saw blade for bench or radial saws, sands as it cuts. Thus, it is readily available as a saw blade, disc sander, and jointer without time-consuming changes.

The grit wheel cuts wood, plastics and composition materials. It is particularly suited to production cutting of industrial plastics, since it does not craze, chip or generate heat which can melt the material and fuse the saw kerf.

At a press conference recently, a Skil engineer demonstrated the safety of the grit wheel by holding his finger (without injury) against the edge of a wheel rotating under power. The grit wheel and the other abrasive tools will not scorch material under work because the metal base of the tungsten-carbide grits absorbs and dissipates frictional heat before it reaches a burning point.

Skil Corp., 5033 Elston Ave., Chicago 30, Ill.

Use postpaid card. Circle No. 101

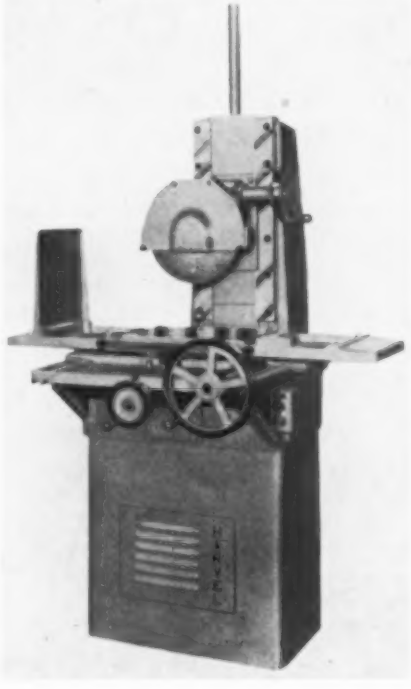
10 x 16" Surface Grinder

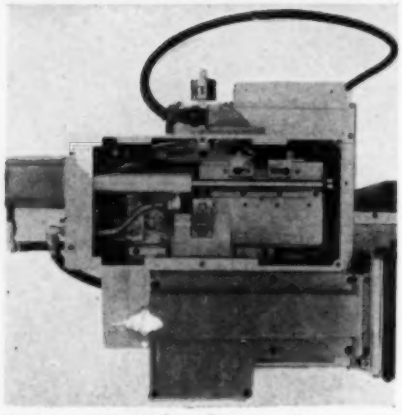
This Harvel surface grinder has a spindle which is a direct motor drive mounted on super precision pre-loaded ball bearings, completely sealed and lubricated for life. It has 160 square inches of table working surface. One horsepower, 1750 rpm motor is included with push button starter. Motor and spindle are precision balanced. Grinding wheel is 12" diameter.

The back edge of the table and tee slots are ground square to spindle and may be used for aligning work. Longitudinal travel is operated by hand feed rack and pinion gear with large hand wheel. Cross feed hand wheel is graduated in thousandths of an inch. Elevating hand wheel is graduated in 1/4 thousandths of an inch.

Harvel Company, 5135 Coffman-Pico Road, Pico, Calif. •

Use postpaid card. Circle No. 102





Automatic Wheel Dressing To Tenths

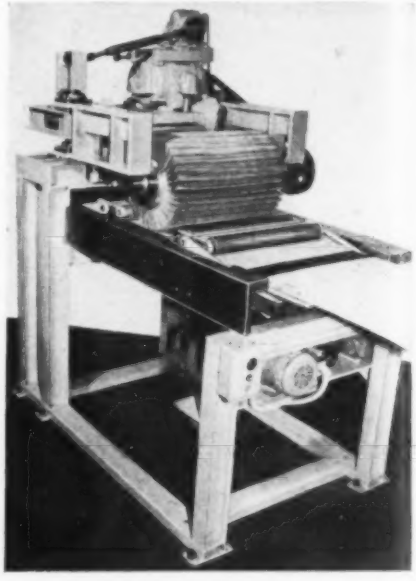
Automatic, hydraulic operation, with dressing accuracies within a tenth, are offered by new Hoglund Model 89 Hydraulic Contour Wheel Dresser.

Designed for use with cylindrical grinders, the unit will dress any angle on the wheel perpendicular as well as horizontal. If necessary, it can undercut grinding wheels and can dress at uniform peripheral speed. Automatic downfeed and optional automatic cross-feed compensate for wheel wear in two planes.

Model 89 is available with precision computed templates for profile widths up to 6″ and profile depths up to 3½″. It employs an inclined plane cam reduction mechanism with hardened, ground, and lapped bearing raceways. (Photo shows cover removed, revealing the templates and mechanism.)

Hoglund Engineering & Mfg. Co., Inc., 343 Snyder Avenue, Berkeley Hts., New Jersey.

Use postpaid card. Circle No. 103



New Machine Sander for Sheet Finishing

A new wide drum flexible sander known as Flex-Drum, capable of sanding up to 60″ widths on a single pass, has been announced by Merit Products Company, Los Angeles. Adapting the "soft wheel" principle, it revolves a continuous series on thousands of projecting abrasive "leaves" which sweep against and across the surface of the work.

The flexible leaves of abrasive ride over warps and ripples, finishing high and low spots with uniformity. It is said the wheel will not "load" on painted or plastic surfaces. This unit features continuous and/or reciprocating feed.

The manufacturer states that the drum alone may be supplied, or the company will custom design the machine in accordance with the requirements.

Merit Products, Inc., 3691 Lenawee Ave., Los Angeles 16, California.

Use postpaid card. Circle No. 104

NOW—put this BRAND NEW MAGNETIC CHUCK to work for you!

PRECISION FINE-GRID DESIGN

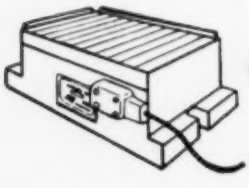
Poles 37% closer together

Greater holding power for small and large pieces.

Hard Epoxy resin separators or Magna-Lock special soft metal. Epoxy resin separators are easy to grind in and are particularly suited for electolytic grinding operations because they resist electrolytic action. Magna-Lock special soft metal is preferred by some and is available as an alternate material for all Magna-Lock fine grid chucks.

Available in all sizes.

It will pay you to get all the facts about this powerful new Magna-Lock magnetic chuck *now*. Write Dept. GF-117



Hanchett **MAGNA-LOCK CORPORATION**

BIG RAPIDS, MICHIGAN, U. S. A.

Designers and makers of a complete line of magnetic chucks and devices.

Use postpaid card. Circle No. 235

Please Mention GRINDING and FINISHING or use the handy Reader's Service Card When Writing Advertisers

Abrasive Wheel Gives Brushing Action

A new abrasive wheel composed of thousands of narrow finger-like abrasive strips, which produce a highly resilient brushing action, has been announced by the manufacturer, Merit Products Inc.

According to Merit, the new wheel exerts more exact control in working complex contours and curvatures without flatting or digging. The strips of abrasive flex to fit over and around changing contours. The wheel is primarily useful in polishing, deburring and removal of surface flaws on all metals.

Sizes now offered include diameters of 14″ and 16″ with widths from 3″ to 60″. Selection of grits range from fine to coarse.

Merit Products Inc., 3691 Lenawee Avenue, Los Angeles 16, California.

Use postpaid card. Circle No. 105

PRESSURELESS MEASURING GAGE — Extremely delicate parts such as light springs, bellows, diaphragms, vacuum tube grids and the like can now be measured without distortion by means of "pressureless" comparator manufactured by Federal Products Corp. Sensitive gaging contact exerts practically no pressure on workpiece. Gaging contact is raised and lowered by a special type of wire which has rapid response to heat and is made to fluctuate in length by being alternately heated and cooled. Federal Products Corp., Providence, R.I.

Use postpaid card. Circle No. 135

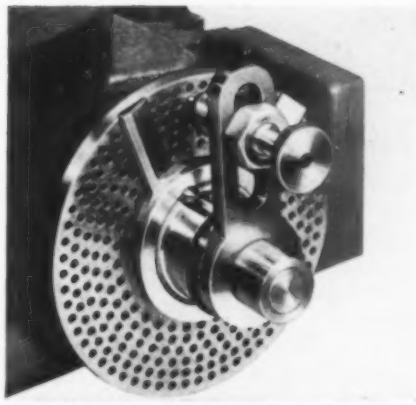
Abrasive Wheel Cut-Off Saw for Ferrous Metals

The Backus saw, with a quick removable guard for easy changing of wheels, is made for high speed, accurate cutting of small bars, shapes, tubing and pipe of steel, alloys or other ferrous materials.

The new saw has a standard make motor, accurate work stop, quick action vise, plus specially engineered leverage that gives the operator maximum "feel." This Model R-1000-A is already machined for adaption to the Backus conversion unit to handle both ferrous and non-ferrous cutting.

Backus Machine Works, 530 Route 17, Carlstadt, N.J. •

Use postpaid card. Circle No. 106



DIVIDING ATTACHMENT for use with its line of rotary tables has been announced by Universal Vise and Tool Co., Parma, Mich. Attachment fits all models of Universal's rotary tables. Divisions obtainable are 2 to 63 inclusive and 27 additional divisions to 100.

Use postpaid card. Circle No. 136

The A. S. Campbell Company of East Boston, Massachusetts—47-year-old manufacturer of metal stampings, dies, fixtures, jigs, and tools – produces large quantities of automotive parts and accessories for the automotive industry. At the semi-finishing stage of producing bumperettes, the Campbell Company is using JEWEL BRAND ABRASIVE BELTS.

To meet consistently tight production schedules plus high quality, low-cost specifications, JEWEL BRAND BELTS offer (A) FASTER FINISHING because of sharper, tougher cutting grains that polish metals with minimum clogging or filling; (B) LOW-COST FINISHING . . . uniformly-high quality of belts plus unique velvet joint assures longer service life, less operator fatigue; consequently, minimum operating costs. If these results interest you, why not test JEWEL BRAND BELTS in your own plant? Write for complete details on sizes and grits available . . . Abrasive Products, Inc., 517 Pearl St., South Braintree 85, Mass.

Abrasive Products, Inc.

SOUTH BRAINTREE 85, MASSACHUSETTS · MAKERS OF JEWEL COATED ABRASIVES

Use postpaid card. Circle No. 236

Bay State Announces New Foundry Cut-Off Wheel

The new BZ2AA reinforced cut-off wheel for off-hand floor stand and swing-frame applications claims to give exceptional wheel life. In early laboratory cutting tests, conducted under controlled conditions, the improved cut-off wheel averaged 33% longer life than Bay State's BZ2 cut-off wheel previously established for these applications.

The increased efficiency of the new wheel results from an improved resin bond. This bond is described as having wearing qualities more closely matched to the wearing and fracturing behavior of the abrasive grain, and possesses chemical and heat-resistant properties.

This cut-off wheel is recommended by the manufacturer for foundry cut-off work particularly. Diameters are available from 12″ to 20″; thickness from 1/8″ to 1/4″.

Bay State Abrasive Products Co., Westboro, Mass.

Use postpaid card. Circle No. 107

Flat Finisher for Wet Abrasive Belt Grinding

The new Hammond Model FF-6 Flat Finisher is built for wet abrasive belt grinding, polishing and deburring of flat work such as sheets, strips, bars, stampings, plates, etc., up to 6″ wide by 6″ high. The FF-6 is available with a single head, or, if several operations are necessary, it is available as a multiple head machine. The abrasive belts are carried by two rolls; a powered contact roll and a tracking idler. Vertical adjustment is manually controlled and tensioning on the idler roll is maintained by adjustable air pressure. Head motors up to 7½ H.P. are available.

An electro-magnetic platen is used to hold material on the conveyor belt for positive drive under the contact roll. The magnetic force is variable to suit the size or mass of the work. Correct adjustment of the magnetic force allows parts to move easily off the platen without sticking, lagging, or piling-up on the conveyor. Hold down rollers, mounted ahead and behind each contact roll, are used when non-magnetic material is to be processed.

Spray, mist, fog, and splash are trapped by the metal enclosures around each head to insure a clean, dry work area.

The new machine is being shown in operation at the National Metal Exposition, Nov. 4-8, Booth 1311.

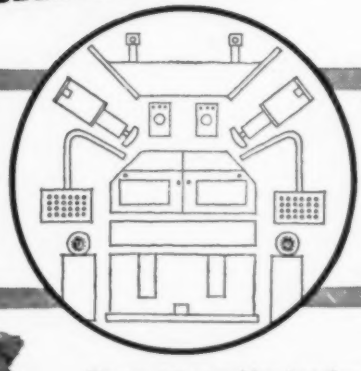
Hammond Machinery Builders, 1651 Douglas Ave., Kalamazoo, Michigan.

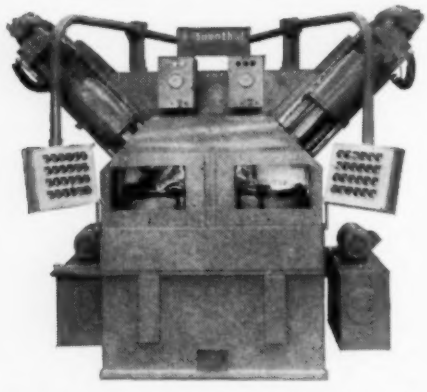
Use postpaid card. Circle No. 108

SIMPLE AS ABC...

the STANDARD BUILDING BLOCK TECHNIQUE OF MACHINE DESIGN

FORD wanted a machine to finish grind in excess of 100 impeller housings and 100 covers an hour. Frauenthal Division—Kaydon was given the job.





They put the machine together "building block" style . . . AND SPECIFIED TWO STANDARD SUPER PRECISION SPINDLES. The machine is working right now . . . turning out 138 pieces an hour on each side, at 80% efficiency.

Standard's new catalogues on Spindles, Slides and Feeds is a handbook of special machine components . . . with complete working drawings, dimensions and capacities. WRITE FOR YOURS TODAY!

America's most complete line of super precision spindles; also slides, feeds and tables. Spindles — motor driven and independent drive — ¼ H.P. to 200 H.P.

SUPER PRECISION SPINDLE DIVISION

the STANDARD electrical tool co. SINCE 1912

STANDARD SETS THE PACE!

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Booth 1641, Metal Show, Chicago, Nov. 4-8

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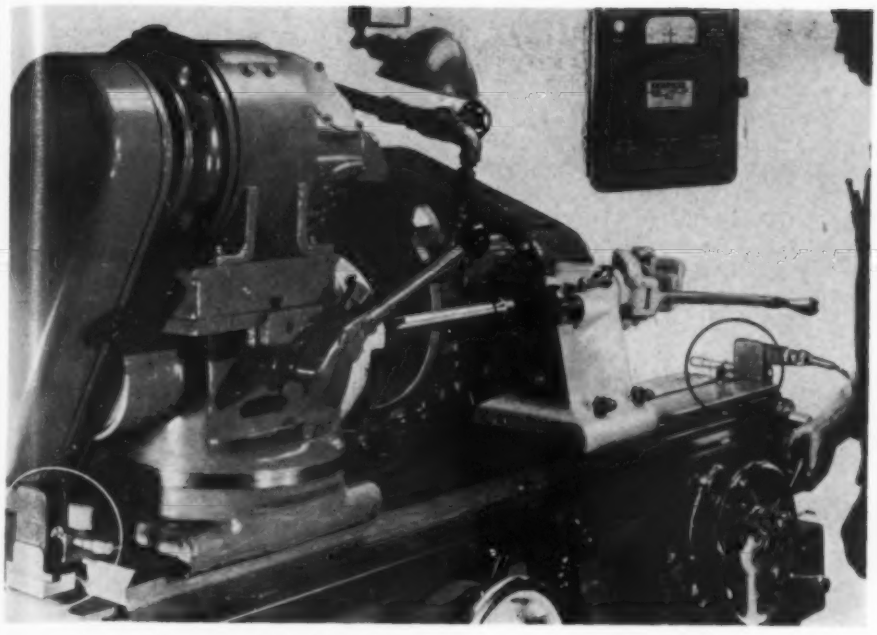

New Gage Speeds Grinder Output

A new work positioning gage, called the Sure-set, applies a new idea to positioning of the swivel table on universal type grinders: the operator can produce work of desired straightness, cylindrical or tapered, without any need for charts, correction tables, mathematics, or repeated trial and error grinding. It can be used successfully with any make universal grinder of reasonably good capability and on a swivel table of any length.

The gage incorporates two completely enclosed electronic gage heads which locate on the grinder at the ends of the table and work into a special amplifier through a selector switch. Associated with the amplifier is computing circuitry which automatically corrects for the difference between work length and table length. The operator need only take one set of manual measurements after his trial cut, adjust the table according to meter indication on the amplifier panel, then finish grind. This same procedure applies even when the work is long and tolerances are in tenths.

Federal Products Corporation, Providence, R.I.

Use postpaid card. Circle No. 109

Vinyl Plastic Lined Tumbling Barrels

Visibility, ease of cleaning and long wearing qualities are improved with these orange-colored vinyl plastic lined tumbling barrels. The resilient linings feature a special "No-Seam" application and provide a smooth, light-reflecting surface for cleaning and inspection.

Available on all Rampe tumbling barrels for new equipment or replacement, the orange linings replace earlier black plastic linings. They are highly resistant to wear and abrasion, oils and most chemicals.

Rampe Manufacturing Company, 14915 Woodworth Avenue, Cleveland 10, Ohio.

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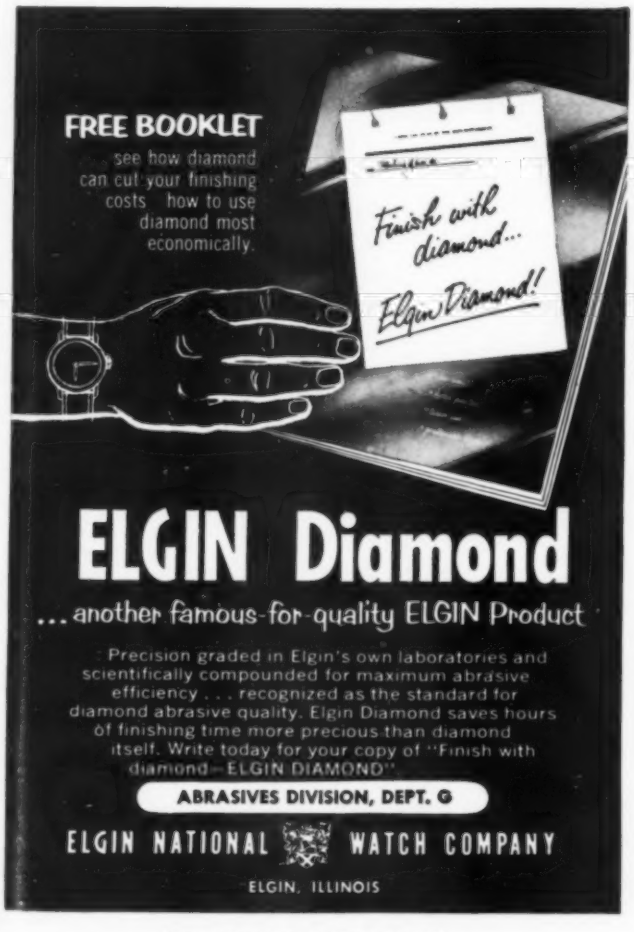
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see how diamond can cut your finishing costs how to use diamond most economically.
Finish with diamond...
Elgin Diamond!
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...another famous-for-quality ELGIN Product
Precision graded in Elgin's own laboratories and scientifically compounded for maximum abrasive efficiency . . . recognized as the standard for diamond abrasive quality. Elgin Diamond saves hours of finishing time more precious than diamond itself. Write today for your copy of "Finish with diamond—ELGIN DIAMOND"
ABRASIVES DIVISION, DEPT. G
ELGIN NATIONAL WATCH COMPANY
ELGIN, ILLINOIS

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MICRO ABRASIVES CORP. WESTFIELD, MASS.

COMING UP!

with a SERVICE from our new plant in CUSTOM MADE LOOSE ABRASIVES for better FINE FINISHING of all types

and

a full line of *FINEST QUALITY ABRASIVES* for GRINDING WHEELS and GENERAL INDUSTRIAL USE made for MICRO ABRASIVES CORPORATION by THE NORTON COMPANY

"SERVICE" is our slogan! CALL ON US!

MICRO ABRASIVES CORPORATION
720 SOUTHAMPTON ROAD
WESTFIELD, MASSACHUSETTS

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Atomic "Lamps" Speed Precision Measurement Research

New atomic isotope tubes are being used as "lamps" at The Sheffield Corporation of Dayton, Ohio, to provide super-accurate light sources needed to help precision industries measure dimensions as close as fractions of millionths of an inch.

Mr. Louis Polk, president of Sheffield, revealed they had received the first two Krypton 84 atomic isotope tubes in U.S. industry in the company's Eli Whitney Metrology Laboratory. The tubes, specially developed by West Germany's Bureau of Standards, for the laboratory's use in advanced measurement standards development, create light sources of the utmost known precision and purity. At Sheffield's laboratory, the new lamps will be used in an

interferometer, an instrument that measures light wave fringes to accuracies of less than a millionth of an inch.

The Sheffield Corp., Dayton 1, Ohio.

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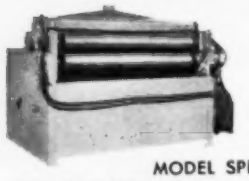
TIMESAVER SPEEDBELT* ABRASIVE MACHINES



MODEL SPL
24", 36" & 50" belt widths

MODEL TOP
24", 36", 50" & 54" belt widths

Both Models of the Timesaver "Speedbelt" Abrasive Machine can be used in tandem for automatic polishing of tops and bottoms of material being processed . . . in one operation.

Mechanize polishing of aluminum, stainless steel and other metal sheets, bars and blanks — perforated or solid

TIMESAVER *SPEEDBELT* Abrasive Machines are the fastest and easiest machines to set-up for production polishing schedules on the market today. Abrasive belts with grit range from 40 to 220 can be changed in 5 minutes or less. Adjustment for stock thickness can be made in seconds. Feed speed is variable from 35 to 80 SFM with lower or higher speeds optional In addition to polishing, Timesaver Machines are used for metal finishing and deburring operations.

Write Today . . . send for the on-the-job story of Timesaver Machines polishing metal grilles and folder describing in detail all the Timesaver features, construction and specifications.

TIMESAVER SANDERS
P.O. BOX 7446 • ROBBINSDALE STATION
MINNEAPOLIS 22, MINNESOTA
See at Metal Show, Chicago, Ill., Booth No. 1342, Nov. 4-8
Use postpaid card. Circle No. 240

Dual Action Burnishing Compound Saves Time and Material

Esbec No. 203, a burnishing compound for use in barrel finishing, is a fine, nondusting, nonabrasive, highly concentrated powdered compound especially designed for high lustre burnishing in aluminum oxide chips and in molded shapes.

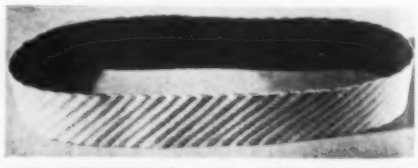
Instead of breaking down and losing cushion after a few hours in aluminum oxide chips or shapes, compound produces progressively better results in time cycles up to 24 hours, the manufacturer claims.

However, satisfactory results are obtained in burnishing cycles of only 45 minutes to one hour. Continual improvement can be expected as the time cycle is lengthened.

Burnisher can be used for "cut and color" operations where deburring and burnishing is done in one operation in aluminum oxide media. By eliminating separate cut, rinse, and burnishing cycles, savings are made in both man hours and material.

Technical data sheets and free test samples are available from the Esbec Barrel Finishing Corp., 18 Beech St., Byram, Conn.

Use postpaid card. Circle No. 112



FOR POLISHING AND GRINDING OPERATIONS, this felt belt features a ribbed construction which is said to offer improved polishing action, cooler running, excellent carrying of polishing agents and long wear. The Shaw Belting Co., 150 William St., Middletown, Conn.

Use postpaid card. Circle No. 137

Free Slide-Chart Selects Wheel Speeds

Handy, pocket-size grinding wheel speed selector will not only determine wheel rpm but will also find correct wheel diameter in inches or surface speed in feet per minute as desired. A reference table, on the back, shows the speeds recommended for each of the standard types and shapes of grinding wheels.

Sales Promotion Dept., Simonds Worden White Co., 1101 Negley Pl., Dayton 7, Ohio.

Use postpaid card. Circle No. 113

Fixture Type of Barrel For Finishing Large Parts

As barrel finishing equipment and methods continue to advance, very large metal parts are being effectively deburred and finished.

Giant compressor housings (285 lbs., 2½ feet along the base), for example, are being deburred and polished in an Almco Model DBF-800-40-1 "fixture" machine, making substantial savings in time and cost over former manual finishing methods. After the barrel finishing process, gasket surfaces are completely burr-free, with low microinch finish. Inside of the housing is entirely clean, with all particles eliminated.

The "fixture" type of Almco barrel utilizes custom-designed fixtures to hold the large part securely during the work cycle, yet permitting abrasive action to reach all surfaces. Very intricate parts, with complex configurations, can be so processed in such equipment.

The door-mounted fixtures are designed for easy removal with allied handling equipment.

The Almco 52-page barrel finishing handbook will be sent upon request.

Almco Div., Queen Stove Works, Albert Lea, Minn.

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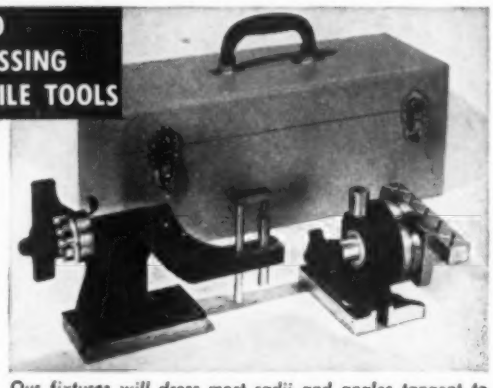
Now ANGLE TANGENT TO RADIUS WHEEL DRESSING WITH NEW VERSATILE TOOLS



MIGHTY GOOD AT ANY PRICE BUT TOPS AT ONLY $149.50
(Both tools including diamonds)

The G-5 RADIUS DRESSER is a precision engineered tool that will dress either a convex or a concave radius from .015" to 1.750" on a 7 inch or 10 inch wheel, and it may be set to the exact radii desired. Graduated stops allow you to dress any desired portion of a radius. The spring tension journal insures chatter free operation. The G-2 ANGLE DRESSER AND TOOL HOLDER is actually two tools in one, having an easy to read vernier scale 0° to 180° giving accuracy within 2" of 1°; an excellent time saver to set up small jobs to be milled, drilled, tapped, etc., on any desired angle.

Our fixtures will dress most radii and angles tangent to each other, similar to those shown below.

FREE handsome, wooden storage box. Write for complete information.

PURCHASE EITHER TOOL SEPARATELY

Now you can purchase either the G-5 Radius Dresser or the G-2 Angle Dresser and Tool Holder separately if you so desire. (Without storage boxes)

G-5 Radius Dresser complete with diamond $80.00.

G-2 Angle Dresser and Tool Holder complete with diamond $87.50.

Replacement diamonds are always available for our units at a reduced price. Diamonds for the G-2 $5.00 each; diamonds for the G-5 $8.00 each.

Distributorship available in select territories

ROTHFUSS TOOL COMPANY

BOX 2696, ELMWOOD STATION PROVIDENCE 7, R. I.

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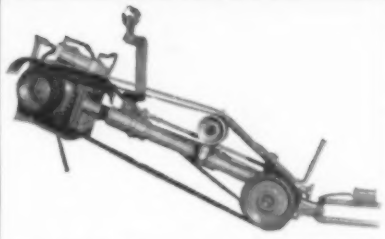
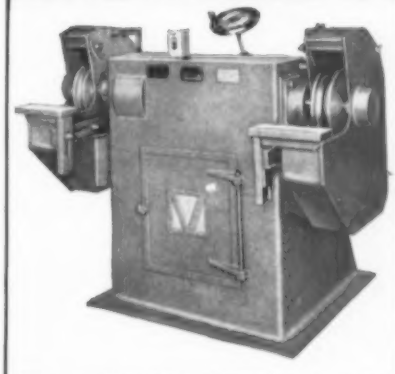
G and P "HD"



Here's a heavy duty swingframe BELT grinder to do those tough, difficult jobs quickly and easily. Wide choice of horse power, belt dimensions and SFPM. Adaptable to special applications combined with other machines. Write for interesting Bulletin No. 110.

MARSCHKE



The undisputed champion in any grinder division. Precision built to provide maximum wheel life and metal removal. A maintenance man's favorite for long, trouble-free service. Write for Bulletin No. 108.

MARSCHKE

The finest heavy duty swingframe grinder on the market today. Built to withstand plenty of abuse, affords extreme maneuverability, dependable as the Rock of Gibraltar. Write for Bulletin No. 112.

Grinding and Polishing Machinery Corp.
SUCCESSORS TO KONNEGUT MOULDER CORPORATION

2530-B WINTHROP, INDIANAPOLIS 5, IND.

Use postpaid card. Circle No. 242

Cincinnati Milling Holds Technical Seminar

Frederick V. Geier, President of The Cincinnati Milling Machine Co., on Sept. 30 opened a Technical Activities Seminar at the Mill which extended through October 10. More than 1000 executives and engineers from all over the country attended the meetings.

Two programs ran concurrently and dealt with different subjects which were discussed by the Mill's engineers and scientists. Each program lasted one day and was repeated daily throughout the Seminar. Discussions dealt with research findings and development engineering, ranging from the numerical control of machine tools to the problems of machining the new hard-to-machine alloys that are vital to supersonic planes and guided missiles; and from new ways to form metal by chipless machining to the use of ceramic cutting tools.

Through the medium of TV, visitors saw certain research activities and equipment which could not be installed in the auditorium because of size or other factors. The telecasts originated in a laboratory and were used by various speakers in the auditorium to illustrate some of the significant research and engineering developments discussed.

During the Seminar, a new drill grinder was introduced. According to Hans Ernst, the company's director of research, the new grinder generates a spiral point on twist drills. Demonstrations were given which sought to show that a spiral point drill gives better cutting action, is more productive and reduces drilling costs.

A demonstration was given of the Mill's Remote Control System for machine tools. A visitor in the auditorium was chosen to operate a machine 1000 feet away in a laboratory. No mechanical linkage between the machine and the operator is required. The audience watched the demonstration on a large TV screen on the stage. According to the Mill's engineers, this system has application on large machines where the operator's control station is some distance from the area of cutting action. Another application was on machines cutting radio-active material where the operator is separated from the machine by an effective shield.

Following each day's program, visitors toured the company's research laboratories and shops. Hans Ernst, director of research, was in charge of one of the programs, while P. Willard Crane, executive research director, was M.C. for the other program.

FIRST IN FILTRATION ADVANCEMENT

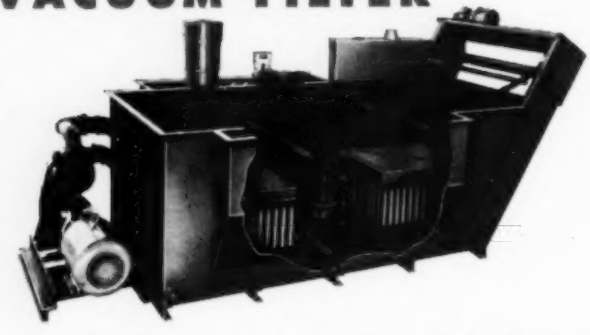
Delpark Announces . . .

THE

Dual Manifold Filter-Matic

VACUUM FILTER

For Constant, High Efficiency Filtration • 5 to 1000 G.P.M. Flow Capacities • 2 Different Filter Element Designs • 2 Forms of Permanent Filtering Media.



Smaller size with greater filtering capacity has been designed into the new Dual Manifold Filter-Matic. Through the Dual Manifold principle, the clean coolant reservoir, no longer a part of the filter, can be varied to meet the specific needs of the system. Constant filtration is achieved by opposite cycling of the dual manifolds. When one manifold is filtering the other is backwashing on the cleaning cycle. Absolute filtration is possible through precoating.
There's more to tell of the advantages through this newest filtration development for industry.

Write for more complete information.

Delpark

—First in Filtration Advancement

INDUSTRIAL FILTRATION COMPANY
76 INDUSTRIAL AVENUE
LEBANON, INDIANA

Use postpaid card. Circle No. 243

Ford's Biggest Machining Job

The biggest single machining job ever attempted by Ford Motor Company will be undertaken next month when the grinding and polishing tables in the Rouge glass plant, in Dearborn, Mich., are resurfaced.

The 212 cast iron tables which carry glass under the grinding and polishing machines must be kept level and free of waves in order to maintain uniform thickness in the glass, plant officials explained.

A milling machine specially built for the job will shave a fraction of an inch of metal from each table to produce a surface which will be perfect in smoothness, within five thousandths of an inch tolerance.

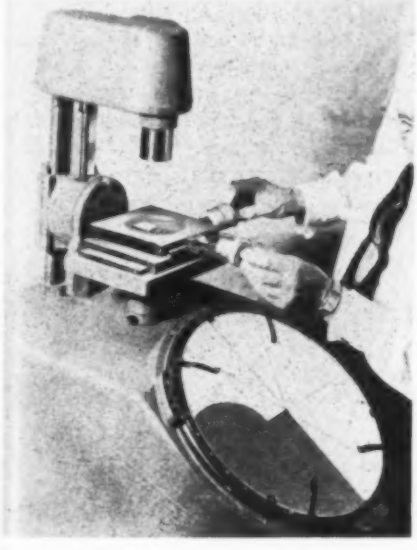
The surface area of the tables is about 20,000 square feet, and the milling process is expected to remove more than 17 tons of chips.

"If you want the time—ASK!"

MODEL AXO SUMP CLEANER. 30 to 50 gallons per minute.

Micro Projector

This micro projector features a vertical principle of design offering the advantage of a horizontal stage onto which work of a flat nature is simply laid without aid of fixtures or holding devices. Also featured are a comfortably inclined screen on which the enlarged image is reproduced directly in front of the observer and a choice of fixed standard magnifications that are changed simply by slipping different projection lenses into a vertical socket in which they rest by gravity. When using the micrometer cross slide, both measuring motions are performed on the same plane, namely the horizontal and most natural one.



A rigid floor base makes this model a self-contained unit. The column slide is adjustable for wear by means of gibs and will hold square indefinitely. A graduated adjustment will tilt the stage to a desired helix angle of a thread or rake angle of a form tool.

Custom-made precision coated lenses and achromatic condenser lenses are used for different objectives 10 to 100X magnification. All lenses are set to the correct magnification at the factory.

George Scherr Co., 200 Lafayette Street, New York 12, N.Y. •

Use postpaid card. Circle No. 115

Mushroom Discs and Pads Improve Contour Polishing

For contour grinding or polishing in small radii or difficult contours with portable tools, a new mushroom-shaped molded rubber pad and coated abrasive discs have been developed by Behr-Manning Co., Troy, N.Y., a division of Norton Company.

Discs and pads, currently available in diameters of 5 and 8 in., were designed specifically for getting into contours where disc pads of conventional type may not perform effectively. With the new pad, it is possible in many cases to do an entire contour in one operation. Also, swirl marks and gouges are virtually eliminated, so that subsequent finishing operation can often be dispensed with.

No center nut is required to fasten disc to pad. Instead, discs are held to

REDUCE
Precision Hole Grinding Costs
USING AN
Onsrud®
D1-S
HOLE GRINDER
MOUNTED ON YOUR

¼ HP 30,000 RPM AIR TURBINE GRINDER • SLIDE ADJUSTS TO 0.0001"

OR MOUNT ON JIG BORER TO CONVERT MACHINE TO PRECISION JIG GRINDER

Grind precision holes at amazingly low costs with the D1-S . . . using your present machine tools. A completely RIGID unit guaranteed not to deflect in its vertical alignment. Grease-shielded, long life bearings. Capacity up to 2¾" diameter with ¾" wheel . . . and up to 4" diameter with adapter. Proper high speed and power for dependable, fast operation with toughest steels.

ONSRUD MACHINE WORKS, INC.
PORTABLE TOOL DIVISION
3945 PALMER ST., CHICAGO 47, ILL.

WRITE FOR FREE D1-S HOLE GRINDER BULLETIN 1126

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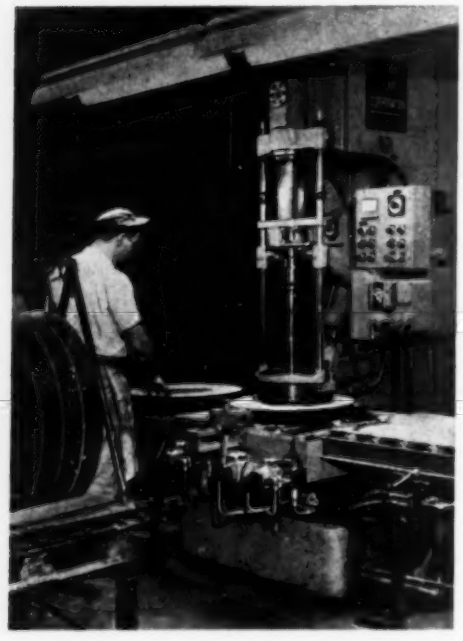
Why MICROHONING

Lowers Costs, Increases Production, Improves Quality of Grinding Wheels

Bay State Abrasive Products Company, one of the largest and most progressive manufacturers of abrasive products, Microhones the arbor hole of their snagging wheels to secure improved wheel performance, reduce manual handling, lower processing costs and increase production.



Why Microhoning Saves Time, Energy and Reduces Processing Costs of Arbor Holes over 50%:

1. **Less Equipment**—one Microhoning machine does work of two grinders.
2. **Less Operating Costs**—Microhoning processes 450 to 600 grinding wheels per set of abrasive sticks; abrasives cost was substantially higher with former grinding method.
3. **Less Maintenance**—Hydrohoner has no chucks to maintain and there is now only one machine instead of two.
4. **Less Gaging**—Microhoning *automatically* brings arbor hole to size within .003" tolerance; former grinding method required repeated gaging during operation.

Why Microhoning Improves Performance of Grinding Wheels:

1. **Better Fit**—inherent qualities of the Microhoning process are geometric accuracy and ability to hold close tolerances . . . rounder and accurately sized arbor holes assure a better fit.
2. **Less Arbor Wear**—Microhoning cuts both abrasive grain and resinoid bond while producing a smoother hole.
3. **Less Chatter**—Microhoning assures arbor holes that are square with faces and more concentric with O.D.

See page to right for "How Microhoning" accomplishes the above results.

The principles and application of Microhoning are explained in a 30-minute, 16mm, sound movie, "Progress in Precision" . . . available at your request.

☐ Please send me "Progress in Precision" in time for showing on_____(date).
☐ Please have a Micromatic Field Engineer call.
☐ Please send Microhoning literature and case histories.

NAME_____ H

TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____

MICROMATIC HONE CORP.
8100 SCHOOLCRAFT AVENUE · DETROIT 38, MICHIGAN

Use postpaid card. Circle No. 245

the pad by an adhesive packaged in tube applicators. Abrasive discs are made in Resinall Metalite cloth, an aluminum oxide abrasive with an all-resin bond, in grits 120-X, 80-X and 50-X.

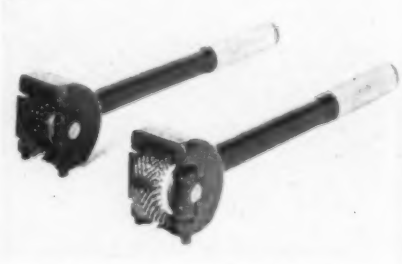
Pads of 5 and 8 in. diameters are made in the proper density for polishing; a third mushroom pad in 5-in. diameter is made in a harder density for stock removal. All may be used on any portable pneumatic or electric grinder.

Use postpaid card. Circle No. 116

Wheel Dressers—Finisher or Rougher

Hand dressers for off-hand dressing operations contain either the finisher or rougher ball bearing cutter assemblies, as shown. The rougher assembly is recommended for snagging operations.

The holder is made completely of steel, with the handle machined from bar stock, preventing breaking or cracking due to stress. The handle is 12 inches long—over-all assembly, 15½ inches. Full contact is always made with the wheel, eliminating dig and bounce. Because of this, rounder wheels are produced.



AER-O-MATIC DRESSERS. Two types.

Feet designed to traverse across the

tool rest to give the wheel the accurate finish, and provide necessary leverage, are removable and can easily be replaced when worn.

Aer-O-Matic Tool Co., 5059 W. Diversey Ave., Chicago 39, Ill.

Use postpaid card. Circle No. 117

Roll-Away Dust Bin with Nine Cubic Feet Capacity

Designed by the Aget Manufacturing Company, the Model 5NB20 Dustkop is admirably suited to any operation where dust volume is large, the need for air volume is comparatively low, and floor space is at a premium.

This dust bin for shop operations of the chip-producing variety has a nine cubic foot capacity and seldom requires emptying in the course of a normal day's work load. It has a one-third horsepower motor and a cast aluminum fan capable of handling sizable metal fragments and wood chips without plugging. The model pictured is outside vented.

The dust bin is also available as a recirculating collector using a cloth filter bag (Model 5CB20) or the conventional Fiberglas filter (Model 5B20) base—30" x 35", height 51".

Aget Manufacturing Co., Adrian, Mich.

Use postpaid card. Circle No. 118

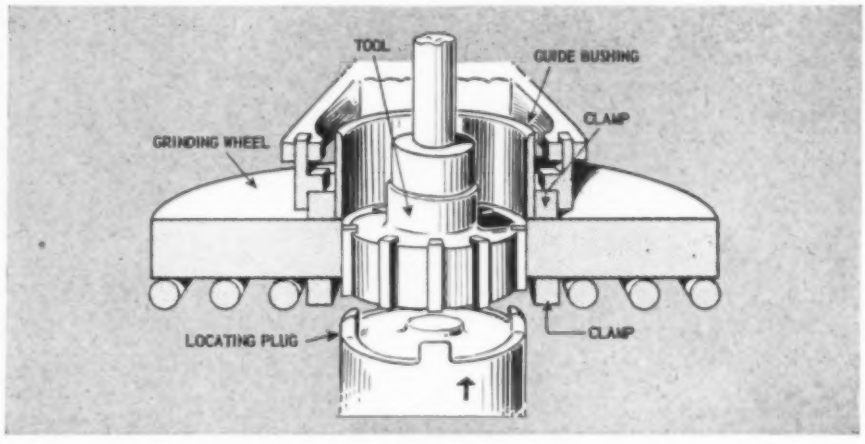
Filter Capacity Raised to 1000 GPM

The Delpark tubular screen vacuum filter has been increased in capacity to handle flow rates to 1000 gpm on water. Designed specifically for the filtration of grinding coolants and cutting oils, the Filter-Matic is said to make micro-inch finishes more easily attainable.

Filtration is accomplished by tubular screen elements manifolded into a suction header box in which a vacuum of 150 psi is maintained. Automatic self-cleaning is accomplished by a float acti-

How MICROHONING Lowers Costs,. Increases Production, Improves Quality of Grinding Wheels

By changing from grinding to Microhoning of arbor holes, Bay State Abrasive Products Company has realized substantially lower processing costs, raised productivity and improved the performance qualities of their snagging wheels.



Here's How Microhoning Now Saves Time, Labor, Material and Processing Costs:

1. Snagging wheels now travel from facing machine to Hydrohoner on a conveyor—there is no manual lifting or handling.
2. A disappearing plug automatically locates wheels in Hydrohoner where they are clamped on the faces and remain stationary during Microhoning operation—there is no manual placing of wheels on chucks, or chucks to maintain.
3. One Hydrohoner does work of two grinders; and one set of Bay State iron bonded, diamond sticks Microhones from 450 to 600 resinoid-bonded wheels—less equipment to maintain and lower costs for abrasive.
4. In approximately a minute, Microhoning removes from .030" to .070" of stock from arbor holes ranging in diameter from 6" to 12"—processing is faster and material is saved because wheels can now be molded closer to final size.
5. Microhoning tool automatically holds diametric accuracy within .003" tolerance—repeated manual gaging is eliminated.

See page to left for "Why Microhoning" provides cost-and-time-saving benefits.

Send Coupon for Complete Information

Learn how Microhoning will give efficient stock removal, closer tolerances, accurate alignment and functional surfaces.

☐ Please have a Micromatic Field Engineer call.
☐ Please send Micromatic literature and case histories.

NAME_____H

TITLE_____

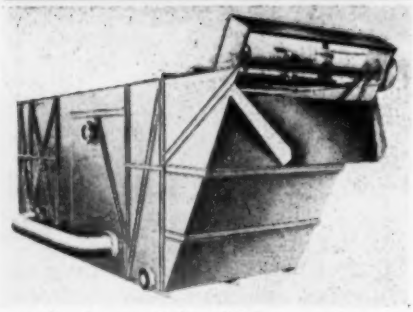
COMPANY_____

STREET_____

CITY_____ZONE_____STATE_____

MICROMATIC HONE CORP.
8100 SCHOOLCRAFT AVENUE · DETROIT 38, MICHIGAN

Use postpaid card. Circle No. 246



vated micro-switch which energizes an air valve and cylinder and reverses the coolant flow through a four-way valve. Filtered coolant from a reservoir is forced back through the manifold into the tubes, knocking off the filtered deposits held on the periphery of the tubular screens. The sediment from the screens is removed by chain-driven flights which deposit the sludge in a tote box for disposal. The flow of coolant to or from the filter is not interrupted during the cleaning cycle.

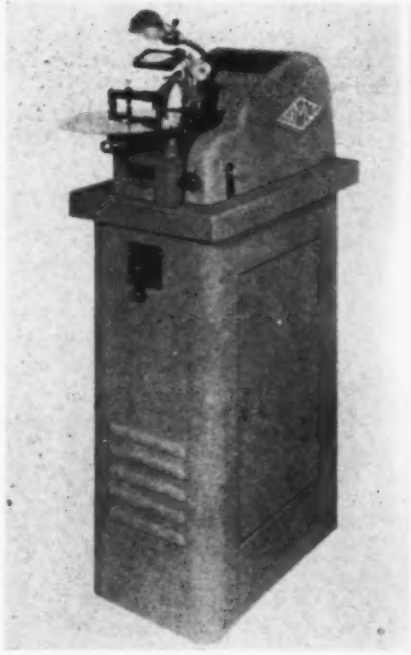
Filter aids may be used for precoating the screens when absolute filtration is required. An automatic precoat feeder is supplied as optional equipment. Multiple units are used for capacities over 1000 gpm. Smaller units available from 5 gpm.

Industrial Filtration Co., Dept. FMH-226, Lebanon, Ind.

Use postpaid card. Circle No. 119

Sharpener for Circular Metal Cutting Saws

A machine which automatically sharpens all circular metal cutting saws from ½" to 14" diameter, from finest teeth up to 2 per inch, has been announced by Hamco Machines of Rochester, New York. Many years of research and experience preceded the perfecting of this machine which now provides a rapid, accurate and economical means of sharpening circular saws.



Carbon and high speed steel blades may be ground with equal ease. This saw sharpener may be used on all steels, brass, copper, bronze, aluminum, and plastics.

Master indexing makes it possible to practically make your own saws by cutting in all new teeth with perfect concentricity, and also to sharpen up to 6 or 7 saws at one time. The best feature is that saws can be sharpened time after time with a minimum of set-up and operator attention.

Hamco Machines, 97 Mt. Hope Ave., Rochester 20, N.Y.

Use postpaid card. Circle No. 120

"We point with pride" . . . to our 116 consecutive years of business in the United States. Each Dessau diamond tool and diamond wheel carries within it the flawless reputation of these many years of service and experience. Our recently expanded precision-shaped diamond tool factory is one more step in our ever growing operations and facilities. Let us solve your industrial diamond problems. Write today for our new illustrated booklet: "Diamonds are a Grinder's Best Friend", and catalogs: "Diamond Tools" and "Diamond Wheels".

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Manufacturers of
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*Another DESSAU Service! We reclaim used or broken diamond wheels and sludge.

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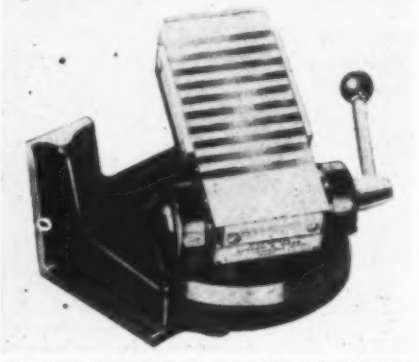


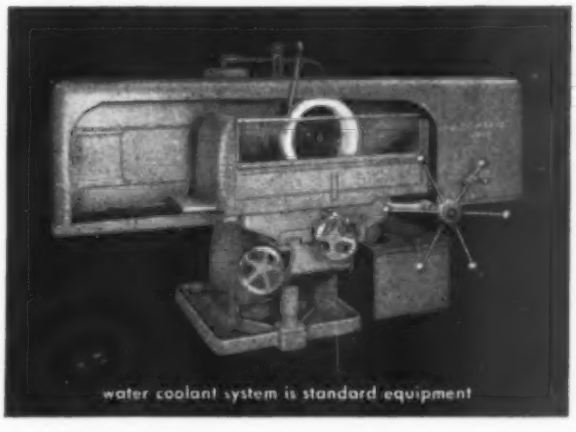
FIMAX UNIVERSAL MAGNETIC CHUCK is an aid in machining and grinding of tools, cutters, gages, and angular components. Any desired angle may be set by circular scales provided, by sine bar or by other means, and then locked securely in position. Operating lever is easily moved to either side of the chuck and is variable in position, eliminating interference with workpiece. Working surface 3-3/16 - 7". Air Transport Equipment, Inc., Amityville, N.Y.

Use postpaid card. Circle No. 121

why MACHINE it off—when you can GRIND it?

Stock really comes off with an Abrasive 18" Face Grinder. Sixty-five thousandths of an inch at a pass! A rugged 15 H.P. motorized Abrasive spindle turns the wheel at 900 R.P.M. Surface speed is 4500 feet per minute. 24" table travel, plus 18" wheel gives big work capacity.

Time is money! Machining flat surfaces wastes both! Grind it off faster, with better surface finishes, with an Abrasive 18" Face Grinder just as leading metalworking plants — those really making money — are grinding forgings, castings and dies.


water coolant system is standard equipment

TYPICAL APPLICATIONS ■ Castings . . . eliminates milling or planing . . . requires less stock to be left on for finishing . . . as much as 3/16" of stock can be saved on each surface. ■ Automobile Body Dies. ■ Plastics Molding Dies. ■ Molded Insulating Fire Brick. ■ Ceramic Insulators. ■ All types of Forging Dies. ■ WHEREVER FLAT, SQUARE SURFACES ARE REQUIRED.

ABRASIVE ACCURACY SPEED PRODUCTION

Complete, detailed, fully-illustrated Catalog is yours free. Write for it.

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EAST PROVIDENCE, RHODE ISLAND

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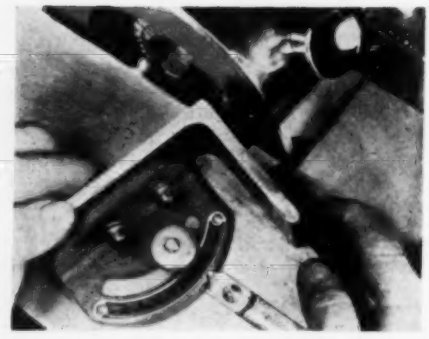


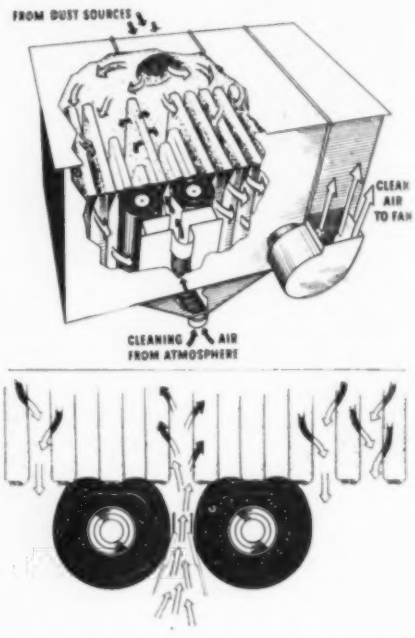
New Tool Rest for Carbide Tool Grinders

The Diamond Tool Company announces a new "Angle-Set" Mitre Gauge for use on tilt tables of carbide tool grinders. The special feature of the new tool sharpening rest guide is its ability to position tools at extremely small angles or extremely great angles while sharpening. The new tool rest is resettable in four assembled combinations to give a complete 180° selection of tool rest positions as indicated on the calibrated 90° sector dial.

Adjustable compression springs hold the movable face plate in position either towards or away from the wheel face. A thumb-screw nut locks the face at the desired angle. The holder can be set up for the entire 180° by loosening two spring holding screws and is quickly reversible for either direction of wheel travel.

Diamond Tool Company, Box 32, South Haven, Michigan.

Use postpaid card. Circle No. 122



Cutaway view (top) shows dust entry into Dynaclone, passage of dust-laden air through filter bags, clean air exit to the single fan, and hose through which reverse cleaning air is admitted to the new "roller cleaner." Close-up view (bottom) shows seal provided by rubber rolls.

New Dust Filter

The new Sly "Roll-Clean" Dynaclone dust filter moves back and forth across the open ends of the filter bags, sealing each bag as it is being cleaned by atmospheric air. This cleaning air is brought into the filter by the main operating fan while the dust filter continues to operate.

With no "false" wall in the clean-air chamber, any single bag can be removed without disturbing the other bags. A complete dust seal is provided by rubber rolls which block off the adjacent bags to prevent pick-up of dust dislodged from the bag being cleaned. The rolls automatically adjust for each row of bags. Easy access for inspection and servicing has been provided by doors at both ends of the dust filter and by access space in the clean air chamber.

The rolls are made of highly wear-resistant gum rubber combined with an inner filling of sponge rubber.

The W. W. Sly Manufacturing Co., Cleveland 1, Ohio.

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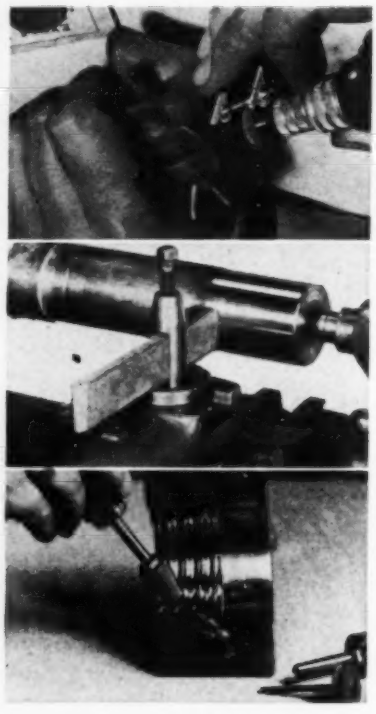
CUT COSTS
SAVE TIME
IMPROVE QUALITY

use **CRATEX**
Rubberized Abrasives

for MICRO-DEBURRING, SMOOTHING, CLEANING, POLISHING on HARD or SOFT METALS and other materials

4 grit textures
Course — C • Medium — M
Fine — F • Extra Fine — XF

WHEELS • POINTS • BLOCKS STICKS • CONES for power or manual application and dimensional control. **CRATEX** is sold through leading industrial supply distributors.



For actual field application reports on how **CRATEX** "cushioned action" can cut costs in your own operations, send this coupon.

CRATEX MANUFACTURING COMPANY
81 NATOMA STREET, SAN FRANCISCO 5, CALIFORNIA

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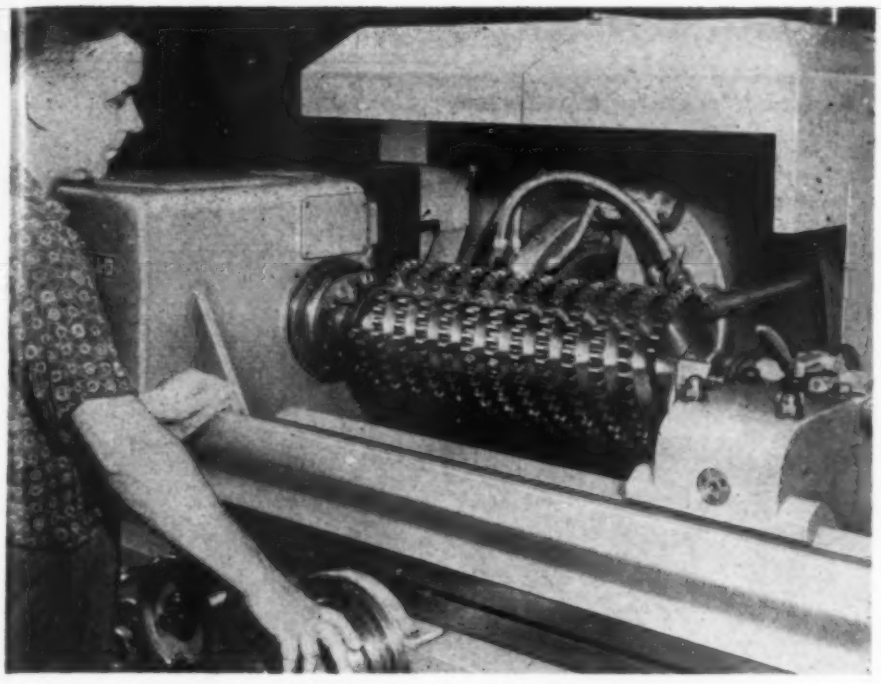

Thread Grinding A Large Worm Gear

Ex-Cell-O Corporation recently utilized one of their Style 36 Precision Thread Grinders to finish the thread form of a huge, 10" O.D. worm gear. Furnished in rough form by a milling machine manufacturer, the company finish ground the hardened steel part in one of its Detroit plants.

Equipped with a standard three-way cradle type dresser, the Style 36 Thread Grinder machined the thread form of the big worm to a triple 6" lead, 29° included angle. Stock was removed to a depth of $1\frac{3}{8}$" and amounted to .170". Pitch diameter was specified at 8.0763".

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WALLS TU-WAY BELT SANDER

USE IT EITHER WAY

Full 1/3 h.p. G. E. Motor

At last, a top quality industrial sander that provides all the most wanted features — yet sells for so little.

complete with cord, plug, switch ready to use **$89.95**

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HANCHETT new HY-POWER grinder

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SHEAR BLADES · KNIVES · FLAT SURFACES

HYDRAULIC TABLE DRIVE

MOTORS: 30 h.p. to 75 h.p. CAPACITY: 60" to 296"

GRINDING WHEELS: 30" or 36" diameter segmental

FULL AUTOMATIC CONTROLS • POWERFUL • ACCURATE

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World's Largest Manufacturer of Knife Grinding and Saw Sharpening Machinery

MAIN OFFICE — Big Rapids, Michigan WEST COAST — Portland 1, Oregon

HANCHETT GRINDERS

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Drum Top Sump Cleaner

Model AXO is a light weight, air operated drum top machine tool sump cleaner, the smallest unit in the RedTop series. The self-sealing lid is easily transferred from drum to drum—it weighs only 33 lb.

The unit develops 275 inches water suction to thoroughly clean chips, oils, coolant and sludge from machine tool sumps, at the rate of 30 to 50 gallons per minute. There is no mess or oil spillage.

The air operated pump has no moving parts, reducing maintenance and service to a minimum. For best operation ⅜" air service at 80 to 120 lb. line pressure is required. The unit is well muffled for quiet operation. Fits standard open top 55 gallon drums. Drum dolly is optional.

Coolant Equipment Corp., Verona, Wis. manufactures the Carnes line of portable sump cleaners and the CeCor line of chip carts, liquid dispensers and drum handlers.

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WHITNON
Precision SPINDLES

Rated Double A for Absolute Accuracy!

Absolute dependability and balance is assured by dynamic electronic balancer that checks spindles after assembly — to provide the ultimate in on-the-job perfection.

America's finest complete line of Precision High Production Spindles for Boring, Grinding, Milling and Drilling

Whitnon precision Spindles have been developed for new and replacement applications. The extra rigidity from large spring pre-loaded bearings assures constant chatter-free life.

Correct pre-loading mechanisms keep Whitnon Spindles and bearings tight at all times to compensate for changes created by temperature variations and wear.

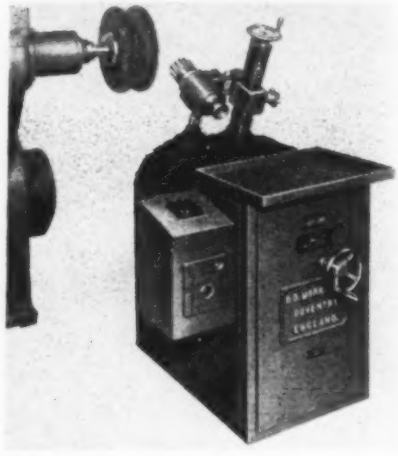
Whitnon Spindles for Milling and Engraving will increase the output of your machines. Whitnon-held tools cut on all lips, hence tools cut better, faster and last longer . . . producing a finer finish.

Whitnon Spindles are built for high speed and long life. Drills stay sharp and produce a straight and round hole.

Write for Literature Today.

THE Whitnon MANUFACTURING COMPANY
ROUTE 6 AND NEW BRITAIN AVE., FARMINGTON, CONNECTICUT

Use postpaid card. Circle No. 252



Semi-Automatic Gear Deburring Machine

The Morrisflex semi-automatic gear deburring machine, Model MA-660, sold by Hammond of Kalamazoo, is designed for use with a polishing lathe and wire brushes to deburr and radius gears, splines and serrated parts. This new machine replaces hand deburring and makes it possible for even unskilled workers to produce uniform finishes.

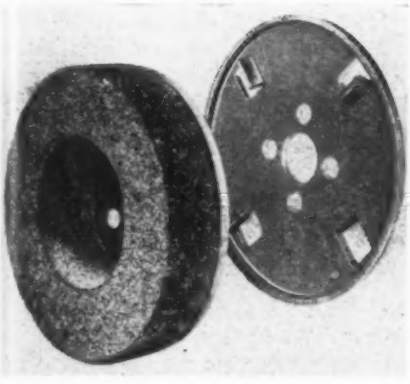
Rotation of the work, constant pressure against the brushes, and dwell time are all controlled by the machine. The work head, located at the top of the traversing arm, rotates at 80 rpm and can be adjusted vertically and horizontally. A lead screw, operated by a hand wheel, provides lateral adjustment of the traversing arm to center the work between the brushes.

A double-acting air pressure system moves the traversing arm from the loading position to the brushes and presents the work to the brushes at the correct pressure. After correct dwell time the pre-set timer switch shuts off the machine and the air system withdraws the work from the brushes to complete the cycle.

The pre-set timer switch is the heart of the automatic cycle. Once correct dwell time is established and set on the dial switch, the operator is required only to load, unload and push the switch button for automatic processing of the work.

Hammond Machinery Builders, Inc., 1651 Douglas Ave., Kalamazoo, Mich.

Use postpaid card. Circle No. 126



Mechanical Interlocked Grinding Wheel

The interlocking principle of the Keystone interlocked wheel minimizes any tendency for the wheel to slip away from its mounting plate, thus providing an unusual measure of safety for the operator.

A product of several years of experimentation and testing by the Keystone Abrasive Wheel Company of Carnegie, Pennsylvania, this wheel has been developed primarily for use on weld grinding machines—machines that require grinding wheels fitted, one side, with steel mount plates.

The mechanical interlock securely locks the wheel to its mount with lugs keyed into the wheel and angled so as to turn in the direction of the wheel's rotation. Sizes ranging from 7½" to 10".

Keystone Abrasive Wheel Co., Carnegie, Pa.

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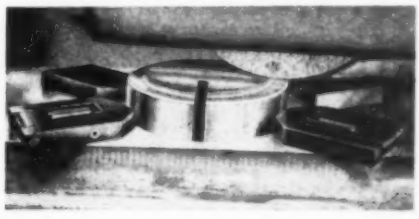

MAGNETIC CHUCK CLAMP is a new workholding device that eliminates elaborate and expensive fixtures for holding non-magnetic materials on a magnetic chuck. By utilizing the on-center lever principle for moving and locking the clamping plunger, this device securely holds both rough irregular castings and finished parts with no threat of distortion or loosening of the work piece due to pressure of tool or grinding wheel. A round shaft or sphere can be held directly on a magnetic chuck making vee blocks or other clamping unnecessary. Set consists of two clamping devices and two solid backup blocks of the same general dimensions and are made in two standard sizes. Lemco, Inc., R.D. No. 2, Cogan Station, Penna.

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Highly efficient, ATECO's new Honing Lap removes material fast. This convenient, economical, durable lap produces an absolutely smooth finish on tool steels and on the hardest carbide tools. Macolaepp grains used in the new ATECO lap are harder than the toughest sintered carbide. Long life, even cutting action guaranteed.

There is a proper ATECO Honing Lap for each job, depending on the finish desired and amount of material to be removed. Grits —160, 220, 360, 500. Send Your Order today!

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$7.50

A new device for precision setting of dividers. Accuracy to .001". Valuable aid to tool makers, draftsmen, lofting engineers, and layout men. Complete with case.

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UTILITY MODEL U-TR

60,000 R.P.M.

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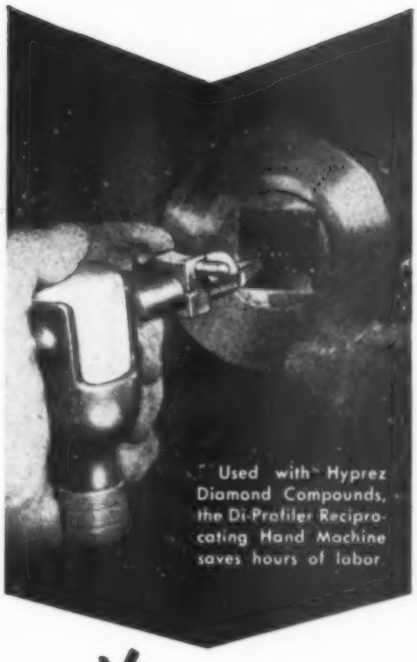

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DUSTKOP MODEL 520-D. Stores twice as much dust.

Large Volume Dust Collector

A special, extra storage capacity dust collector, Dustkop Model 520-D, is ten inches higher than the standard model 520. It has identical air handling characteristics and base dimensions, but a dust storage bin that is over twice as large. Recommended for use in shops where dust volume is unusually large. Where the problem is ordinary, the increased capacity of the 520-D will cut the need for emptying in half. Base, 18" x 23"; height, 34".

Aget Mfg. Co., Adrian, Mich.

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Recasting Process Ends Plating Problems

A process developed by Wagner Brothers Inc. for recasting the copper and zinc anodes employed in metal plating operations is reported to provide metal shapes that improve metal deposition and eliminate hangups and other plating problems.

Referred to as "flat-tops" because of their cut-off, bullet-like shapes, the metal anodes are easy to handle and expose more metal to the plating bath for a given area.

The anodes drop immediately to the bottom of the plating bath as the metal is used. Failure to keep dropping to the bottom of the container as they are consumed by the electrical current causes plating difficulties such as poor metal deposition, bath impurities, sludging.

Wagner Bros. Inc., 400 Midland Ave., Detroit 3, Mich.

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Electro mechanical and hydraulic models produced by one of Europe's largest grinder manufacturers—completely universal with swinging internal grinding heads. 14" x 2" x 5" O.D. wheel with 3 H.P. and 18000 and 35000 I.D. spindles with 1½ H.P. Long conical adjustable plain bearings in both wheelhead and workhead with automatic pressure oil bath lubrication. All machines have automatic table traverse and infeeds.

11" x 20" Electro Mechanical Grinder.....$3750.00
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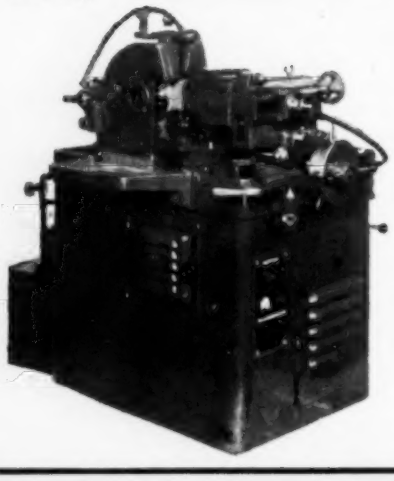

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Close tolerance production units capable of .0001" tolerances in production. Long conical adjustable plain bearings on both grinding wheel and feed wheel spindles with pressure oil bath lubrication. Equipped for bar feed, thru feed, and infeed work with automatic ejectors and automatic cycling on infeed where desired. Diamond or crush dressing on both wheels with contour form and taper dressing of wheels by either hand feed screw or hydraulically.

Model 0—Work Dia. .020"-½", 10 x 2¼" x 5" Wheel with 3 H.P.....$1985.00
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Model 3—Work Dia. .030"-3", 14 x 7 x 5" Wheel with 16 H.P. 4850.00

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"While I haven't had any experience, I DO have man's intuition."

New Industrial Film "Grinding Wheels and Their Application"

A 16 mm. sound, color movie film has recently been completed by Simonds Abrasive Company, Tacony & Fraley Sts., Phila. 37, Pa. This film graphically portrays where and how the modern grinding wheel is used throughout industry. Also included is a discussion of the factors that make up a grinding wheel, and how they are expressed in a typical grinding wheel marking. Running time: 24 minutes.

The premiere occurred at the October 7 special meeting of the Pittsburgh Chapter of ASTE.

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Out of the Rough with CLOVER

Improved appearance is only part of the story. The grinding and finishing process shown above uses Clover Coated Abrasive Belts to put the final touches on the contour and assure the perfect balance required of a professional club.

Clover Coated Abrasives also finish the steel shafts of golf clubs before they are chromed, and help in the shaping and manufacturing of the matching woods. Finishing the leather in golf bags and golfers' shoes involves Clover products, too, and finishing the car that takes the golfer to the links and the utensils that make his breakfast.

The products that benefit from Clover make a bold list, from golf equipment to grand pianos, from hats to hoes, from bassinets to battleships. Why not let Clover look at your grinding and finishing problems? A letter or call will bring a Clover man, or his distributor, to your plant.

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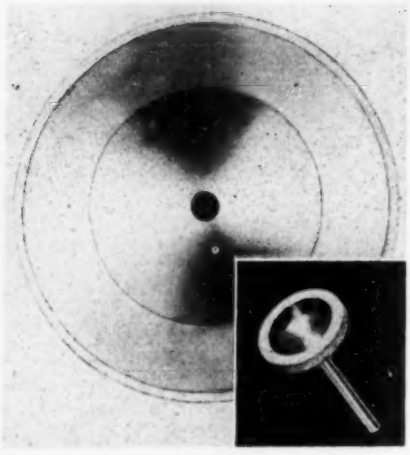

Diamond Coated Saws For Cutting Reinforced Plastics

A new line of diamond coated saws specifically engineered and processed for cutting all types of reinforced plastics is announced by O'Rourke Diamond Company. According to Frank O'Rourke, president of the North Hollywood company, these saws have been successfully production tested by use in major aircraft and missile plants for the past three years. They are also widely used, he says, by makers of printed circuits.

The new saws are available in over 100 types, both mounted and unmounted, in diameters up to 24 inches.

O'Rourke Diamond Company, Inc., Engineering Dept., 11423 Van Owen Street, North Hollywood, California.

Use postpaid card. Circle No. 132

New Achievement in Cooling Solution

A new water soluble lubricant and coolant, representing the first radical departure from the old principle of lubricant-cooling by extreme pressure with petroleum emulsion oils, has been developed.

Dolph Malone, president of Clinton Chemical Company, said his new coolant, known as Crystal Cool, makes use of a natural adhesiveness in the new fluid that results from a chemically generated electrostatic charge. This, he says, prevents the cooling fluid from building up on the metal to more than one molecule thickness. This automated control prevents the stickiness and slow-down of machinery which occurs when using the older emulsions and oils.

Extensive shop use and laboratory tests indicate that the new product is especially effective in working titanium. The American Testing Laboratories of Los Angeles reported that the fluid may be water diluted as much as 60 to 1 without corrosion. This results in the very desirable effect of using water as the most effective cooling medium, while using Crystal Cool as a lubricant without harmful effects to metal and machinery.

Clinton Chemical Co., 1619-20th St., Santa Monica, Calif.

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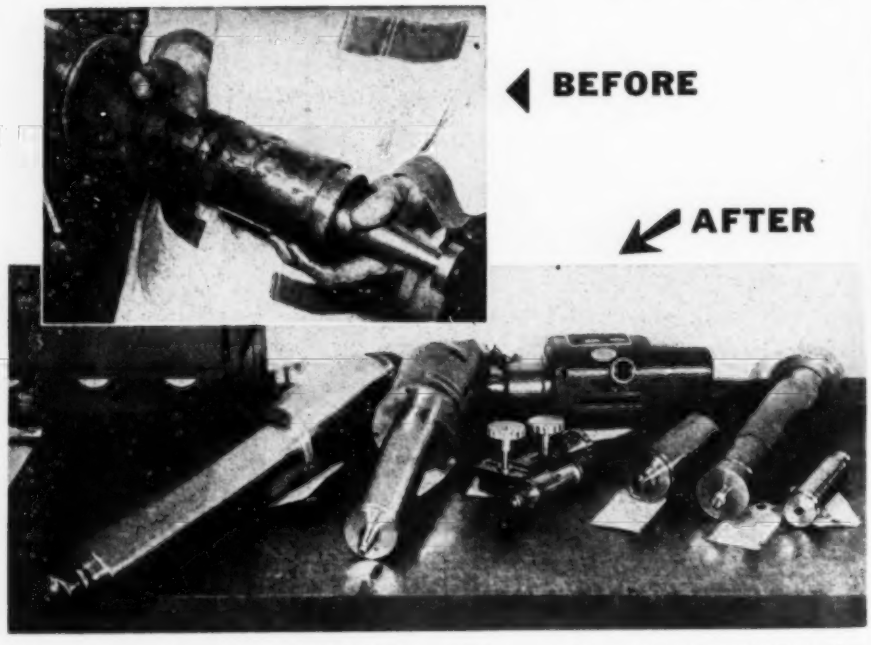

All types and makes of High Speed Internal and External Grinder Spindles and Quills . . . Anti-Friction Live Centers . . . .

Restored to Original Accuracy in HOURS . . . Not Weeks!

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I'd like to have complete information on your spindle repair service.

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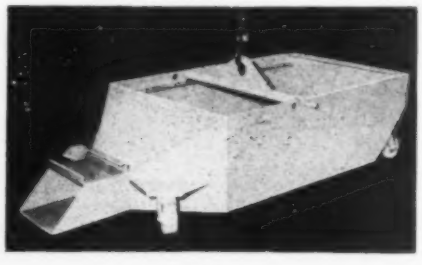

Hopper Pans for Barrel-Finishing Machines

Three hopper pans to speed loading, unloading, storage and transfer of tumble-finishing media are now available from Rampe Manufacturing Co., Cleveland. The welded steel pans have ball-bearing wheels and a balanced yoke.

Standard sizes include a one cu. ft. hand-size pan, and 4 cu. ft. and 8 cu. ft. sizes for handling with crane or hoist hook. All are constructed of heavy-gauge steel plate.

Typical uses of the pans include hopper loading of steel balls or heavy abrasives from storage bins into tumbling barrels, unloading large capacity machines, and rolling pans from bin to bin in preparing special media mixtures.

Rampe Manufacturing Co., 14915 Woodworth Ave., Cleveland 10, Ohio.

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News of Industry

Paul N. Barron (white shirt), superintendent of the California Industries for the Blind, shows the high grade work produced by his drill grinding team to Jack A. Heath, Norton Company abrasive engineer. Clarence Sievers, visual inspector (left), and blind operators Fred Mershon and James De Rosa (right).

Hiring the Handicapped is Good Business

A wide variety of manufactured products are being turned out by men and women with handicaps, who in another age would have been doomed to a life of idleness. The California Industries for the Blind, in Los Angeles, is providing profitable employment to 152 handicapped people. Strictly a business enterprise, its products and services are sold on the open market on a competitive bid basis against all comers.

Typical of the varied services provided by this organization is the resharpening of high speed drills for many of the large industrial plants of the area. These drills, ranging in size from the very fine sizes to a quarter of an inch in diameter, are ground by sightless operators at the rate of 800 drills in a normal eight-hour day. The operators can regrind any desired drill point angle using conventional drill grinding attachments without special devices. The quality of the work is equal to or better than much of the tool grinding done by people with normal vision.

What started as an experiment in rehabilitation in 1928 is now a full-grown business enterprise. Many of these 152 people are self-sufficient, tax-paying citizens—and all given an opportunity to lead a useful, productive life. •

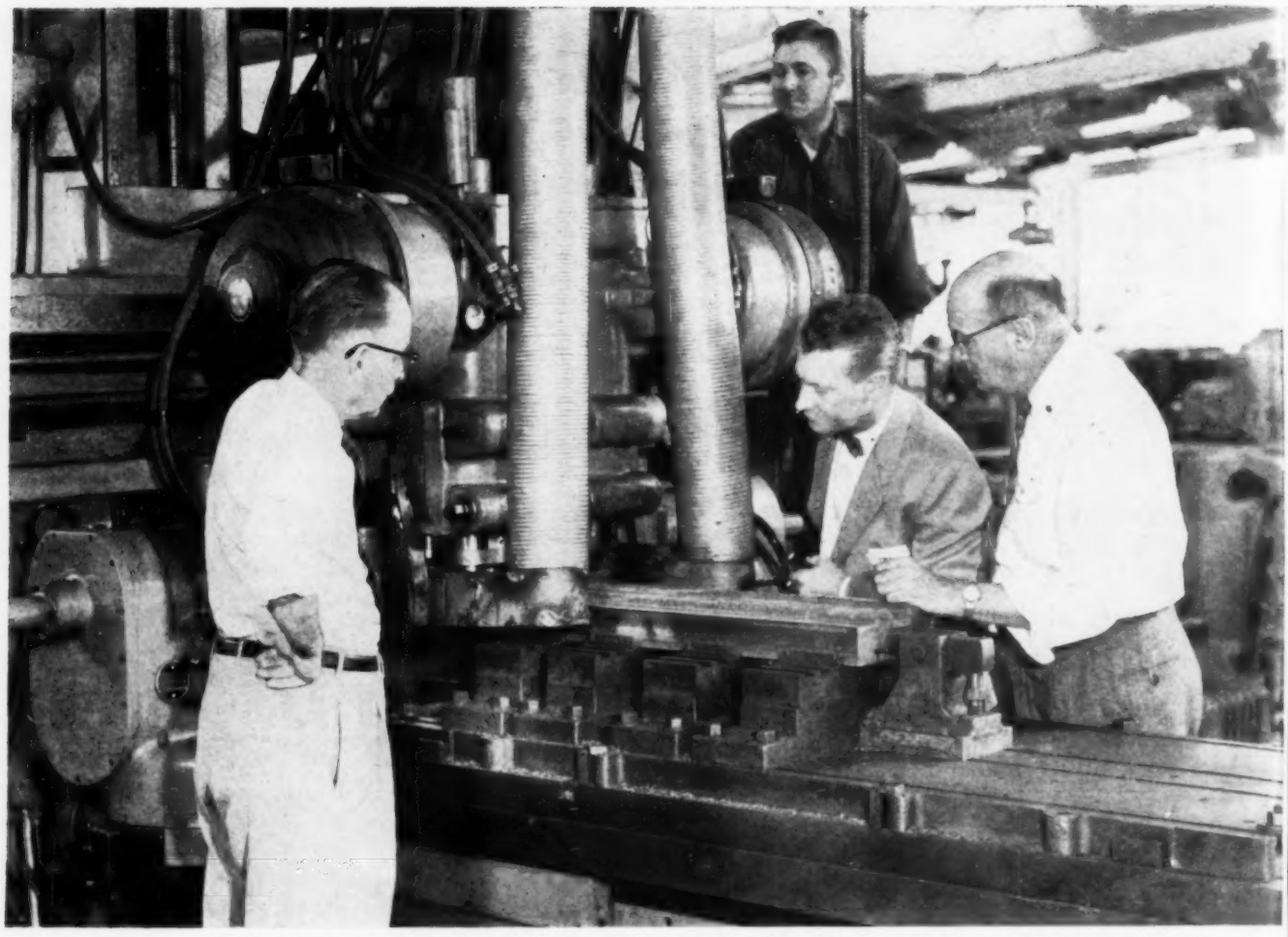
Koebel Reveals Big Use For Small Industrial Diamonds

Low-cost small diamonds weighing only about 1/50th of a carat will do jobs for which diamonds as large as 20 carats were once used, the Detroit Chapter of the American Society of Tool Engineers was told in a recent meeting by Charles J. Koebel, President, Koebel Diamond Tool Co., Detroit.

A five year development by the Koebel company in cooperation with the Jones & Lamson Machine Company in Springfield, Vt., has resulted in a practical process and tooling for utilizing such diamonds in cutting tools. (See G&F, May, 1957 issue for a complete report on this development.)

Koebel stated that the new cutters would be far more reliable than those using single big stones. Pointing out that tremendous variations exist between the cutting actions of individual diamonds, he went on to say that using numerous diamond particles cemented into metal eliminate the effect of such variations. "The development," Koebel said, "makes it possible to offer industry diamond tools in which the average action of the many small diamonds in the tool is predictable and reproducible from cutter to cutter and tool to tool." These considerations are of great importance, he pointed out, in the successful development of automatic machines and tooling for such machines.

In one experimental run, a cutter was used to dress a series of grinding wheels. After dressing 167 miles of wheel surface on 15 resinoid wheels during a period of over 124 hours of machining, wear on the cutter was



Left to right, Ira R. Ogilvie, Sales Promotion & Advertising Manager of George Gorton Machine Co., the machine operator and Darrell Ward, Field Editor of Hitchcock Publications, and William P. Lipp, Gorton Plant Superintendent, watching the machining operations on the bottom of a milling machine table.

THE MAN FROM HITCHCOCK

Darrell Ward, Hitchcock field editor, was impressed with what he saw at the George Gorton Machine Co., Racine, Wisconsin. And with good reason, because he was looking at a specially built planer type mill designed to perform a revolutionary machining operation—17 operations on all surfaces in only two passes. He saw a triumph of automation that will boost production and lower manufacturing costs.

Darrell typifies the men from Hitchcock who continuously probe the metalworking, woodworking, and public passenger transportation industries. Their accurate reporting and timely editorial have won maximum readership from the audiences they serve.

If your interest is only in media quoting highest circulation and page sales figures, then readership probably won't mean much to you. But if you are planning a program directed to metalworking, woodworking, or public passenger transportation people built on the solid reality of proven readership, then Hitchcock publications will do a power packed, undiluted sales job in your market.

METALWORKING

Machine & Tool Blue Book
Machine & Tool Directory
Grinding and Finishing
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WOODWORKING

Hitchcock's Wood Working Digest
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only 3/10ths of a thousand of an inch.

The president of the Koebel company revealed that non-exclusive, non-restrictive licenses for the use of cutters and process are being offered by Jones & Lamson to all machine tool builders. •

Air Conditioning and Refrigeration Exposition

Scores of consulting, design and professional engineers are expected to attend the tenth Air Conditioning & Refrigeration Exposition, the most elaborate display of products in the field ever assembled for their needs, according to George E. Mills, the show manager.

The show, the first to be held in Chicago in six years, is scheduled for the International Amphitheatre, November 18 to 21, inclusive. A record-breaking number of exhibitors, over 250, will display 7,500 pieces of equipment and components. The total value of the exhibits is estimated at more than five million dollars.

"The consulting and design engineers are finding that both refrigeration and air conditioning are a growing factor in recommendations to clients and employers," Mr. Mills pointed out.

"Air conditioning is no longer considered simply a matter of lowered temperatures during the summer. All-year conditioning is the modern trend. Humidity control and air pollution are two major aspects. In the field of commercial refrigeration, advances are even more startling. New industrial processes today do not involve refrigeration at some point. . . . Every engineer should make the show a 'must' on his calendar."

Alcoa Stresses Advantages Offered by Aluminum

Convinced that education of the design engineer holds the key to increased usage of aluminum screw machine stock, Aluminum Company of America, today is engaged in a comprehensive effort to accomplish the teaching job. Alcoa's experience has been that talking to manufacturers is not enough . . . that many are using traditional steel or brass screw machine parts because their designers consistently have specified these materials.

Now, through demonstrations, displays, motion pictures and literature, Alcoa is seeking nationally to illustrate the advantages offered by aluminum's free-machining qualities, and its three-to-one volume ratio over the heavier metals.

A highlight of the program thus far was a mid-September machining demonstration in Cleveland, attended by nearly 700 industry designers, engineers and executives. Unprecedented in Alcoa's promotional effort in this field, the exhibition was sponsored jointly with the National Acme Company. During the demonstration screw machines were operated in a reserved area, surrounded by exhibits of aluminum screw machine products of leading appliance, equipment and machinery manufacturers. Their purpose was to demonstrate the comparative machinability of aluminum, steel, and brass on identical products.

News From the American Society for Abrasives

Highlights of the meeting of the Board of Directors of American Society for Abrasives held recently in New York were the election of three new directors, the setting of the Society's first annual meeting for January 18, 1958, in New York, and the granting of a charter to Detroit chapter No. 6.

The officers serving temporarily until election time for the new Detroit Chapter are L. K. Pruett, president and M. F. Schlie, vice-president.

James G. Blair of Fox Grinders, Inc. was elected temporary chairman of the organizing committee for the Pittsburgh Chapter of the American Society at a meeting held Sept. 12. Those attending were confident that a sizable chapter would be formed there in the very near future.

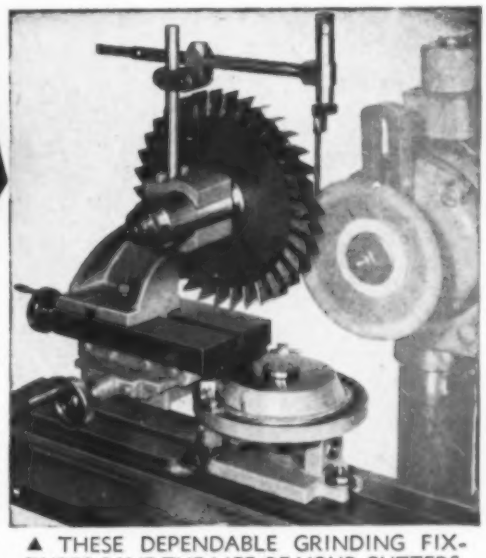
Other chapters of the Society are in process of formation in Long Island, Northern New Jersey, and Cleveland.

The president, John Y. Arnold, Reading, Pa., reported that membership had passed the 250 mark and that a large increase in members was expected.

THE UNIVERSAL RADIAL CUTTER GRINDING FIXTURE

Does 5 Operations without removing cutter from its ARBOR!

On cutters up to 8" in diameter, the No. 6 fixture, as shown with our No. 6A heavy-duty, right-angle, ballbearing spindle workhead:
Sharpens side teeth on **both** sides.
Sharpens peripheral teeth.
Generates small or large radii on **both** corners of each tooth.
(Other workheads available)

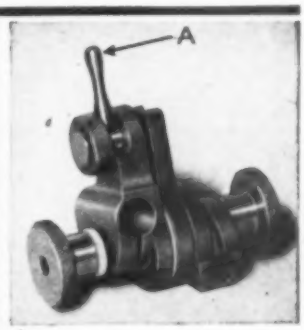


▲ THESE DEPENDABLE GRINDING FIXTURES SAVE THE LIFE OF YOUR CUTTERS. Write for our catalog 603

◀ UNIT 1A
This Universal Cutter Grinding Fixture fits any universal tool or surface grinder.

Radial Grinding Attachment D combines with Unit 1A for sharpening end mills with square, conical, or ball nose shapes. ▼

▲ UNIT 4A
Radial Grinding Fixture for sharpening fluted end mills with square, conical, or ball-nose mills. The index disc provides for multi-flute cutters.



▲ NEW FINE-ADJUSTMENT SLIDING SWIVEL GIVES SMOOTH, PRECISE INDICATOR SETTING. Smooth, positive positioning of finest dial indicator is readily accomplished by the fine-adjustment Sliding Swivel. Final precise positioning is accurately made by slight movement of convenient lever "A".
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SLIDING SWIVEL FOLDER

ROCHELEAU TOOL & DIE CO.
650 North Main St., Leominster 1, Mass.

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More Abrasive Society News

Eighty members and guests attended the first fall meeting in September of the Connecticut Chapter of American Society for Abrasives at the Log Cabin, Wallingford, Connecticut. A. L. Ball, Director of Research and Development, Bay State Abrasive Products Company, spoke on the origin, kinds, processes, uses, and applications of bonds for grinding wheels. His discussion was illustrated with projected slides. The next meeting of the Connecticut Chapter of A.S.A. was held Monday evening, October 28, 1957, at Wright's Steak House, Plainville, Connecticut.

The first general meeting of the Boston Chapter of American Society for Abrasives was held late in October. The following Chapter officers were elected at the first meeting, February 13, 1957: President, H. G. Senning; Vice-president, R. J. Cimon; treasurer, P. E. Bloom. At later meetings committees were appointed to deal with Program, Membership, Arrangements, Finance, and Hospitality and Publicity.

Company Briefs

Celebrating their 22nd anniversary on Sunday, September 15, 1957, employees of the **American Buff Company** toasted their company's growth at a special party.

In a short talk, Ben P. Sax, chairman of the board, traced the company's history from a small shop, servicing but a small segment of the trade, to today's position as a large manufacturer of buffs and polishing wheels for every metal finishing operation.

Detroit Bevel Gear Co., a subsidiary of Gear Grinding Machine Co., has been sold to **Napco Industries** of Minneapolis. Detroit Bevel, Division of Napco, will continue supplying gears to industrial customers and to another subsidiary, **Republic Gear Co.,** under Republic's specifications and quality control. Napco also will supply Republic with after-market products previously supplied by Detroit Bevel.

The Landis Tool Company, manufacturer of precision cylindrical grinders, has appointed the **C. J. Harter Machinery Company,** 3838 Navigation Blvd., Houston 3, Texas, as exclusive distributor for Landis grinders in the Southern Texas area.

Three more branch sales offices have now been opened by **Pratt & Whitney Co., Inc.,** of West Hartford, Conn., according to P&W's president, Edward P. Gillane. Its new Hartford District Sales Office has machinery sales directed by Paul C. Renno, and cutting tool and gage sales headed by Herbert H. Wilbraham. The Milwaukee, Wisconsin, branch, has Frederick D. Watson in charge of cutting tools and gages and Arthur J. LaDucer in charge of machine tools. The Rochester branch office, managed by Stanley E. Huffman, has a new grinding and tool sharpening service. A Charlotte, N.C., branch, which was opened in September, is that area's headquarters for machine tool, cutting tool and gage sales. James F. Royster is manager of this new branch.

Kaiser Aluminum & Chemical Corp., has placed an order with Hydraulik G.M.B.H. of Duisburg, Germany, for construction of a 30-million-pound plate stretcher—possessing nearly twice the power of the largest stretcher now in operation—to be installed as part of the heavy plate facilities in the company's Ravenswood, W. Va., rolling mill. The huge machine will be capable of gripping the ends of a 60-foot-long plate of

These *Rubber-Cushioned,*

MULTI-USE STOCK ABRASIVES DO THE WORK OF SPECIALS....

GIVE A COMPLETELY NEW, WIDER CONCEPT OF ABRASIVE APPLICATIONS

BRIGHTBOY BRINGS YOU SOMETHING DEFINITELY DIFFERENT! A unique working action noteworthy for newness and versatility. Frequently reduces BURRING, FINISHING, CLEANING, POLISHING, to a single-step operation.

SPECIAL FORMULATION is responsible for Brightboy's exceptional adaptability. Abrasive grains and "cushioning" rubber are evenly dispersed throughout the compound. Abrasive and rubber work simultaneously.

STOCK NUMBERS, JOB MATCHED to your regular and special requirements. Silicon Carbide and Aluminum Oxide grains, each from extra fine to extra coarse, in soft, firm and tough rubber binders.

Ask your dealer for Brightboy recommendations and for the Brightboy Catalog listing grains, textures, machine speeds, work suggestions. Write us if he cannot supply you or on any problem in which finishing is involved.

TIME-SAVING FEATURES

Works to close tolerances
Can be shaped to contour
Produces conventional and special finishes and patterns, frequently the final polish
No before-use preparation or dressing
No skilled labor required

GENERAL USES

Removing light digs, tool and heat marks
Cleaning welded and soldered joints
Burring and finishing castings, stampings, machined and molded parts
Maintenance of tools and machinery

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WELDON ROBERTS RUBBER CO.
95 North 13th Street Newark 7, N.J.

America's Pioneer Manufacturer of Rubber-Bonded Abrasives

WELDON ROBERTS Brightboy RUBBER CUSHIONED ABRASIVES

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high-strength aluminum alloy for aircraft construction and literally lengthening it as much as five feet. It will be able to handle a maximum cross-section of 640 square inches. Within this overall limit, it will accommodate thicknesses up to six inches and widths up to 160 inches, in lengths from 17 to 60 feet. Klixon automatic reset overload protector.

Personnel Briefs

Wendell F. Carney has been appointed general sales manager of The Taft-Peirce Manufacturing Company, Woonsocket, R.I., according to an announcement from Frederick S. Blackall, Jr., president and treasurer. Mr. Carney succeeds Walter E. Rogers, who has requested inactive status due to illness. Mr. Carney joined Taft-Peirce in 1941 as a member of the Design Engineering Staff. He was transferred to the sales department in 1947, being made Chicago sales manager. Mr. Carney's most recent assignment has been New York sales manager, a post he has held since 1952. He is graduated from Wentworth Institute in Machine Construction and Tool Design.

David M. Gaskill has been appointed manager of industrial product sales for Airborne Instruments Laboratory, Mineola, N.Y., according to an announcement by E. R. Godfrey, Jr. Airborne's Director of Sales. Mr. Gaskill, formerly manager of industrial equipments for The Brush Electronic Co., received his B.S. degree at Rhode Island School of Design, and is a member of American Society of Tool Engineers, American Society of Quality Control and American Ordnance Association.

Richard R. Read, formerly sales manager of the Taft-Peirce Manufacturing Co., Rochester, N.Y., office, has been appointed branch manager of the Detroit office, and **Herbert A. Potter** has been appointed to succeed Richard Read as Rochester sales manager. Read has served Taft-Peirce in various field sales assignments since 1950, and will now direct sales activities of the complete Taft-Peirce line in the Michigan and Northern Ohio area. Potter will supervise sales of Taft-Peirce standard products and contract manufacturing services in the western New York and Pennsylvania areas.

Wendell F. Carney, Taft-Peirce Mfg. Co.

David M. Gaskill, Airborne Instruments Laboratory

John G. Farabaugh has been appointed to the newly created position of Director of Industrial Relations for Wheelabrator Corp., Mishawaka, Indiana, manufacturers of airless abrasive blast cleaning equipment, dust control equipment, and steel shot and grit abrasive.

The **Landis Tool Co.,** manufacturer of precision cylindrical grinders, has appointed the **R. O. Deaderick Co.,** 317 Gay St., N.W., Knoxville, Tenn., exclusive distributor for Landis grinders in Tennessee. A district sales office to serve Southern Ohio and Northern Kentucky areas has been opened at 15 No. Main St., Centerville, Ohio, with **P. B. Happel,** district manager.

Appointment of **Donald W. MacLeod** as sales supervisor in charge of Elgiloy, multi-use industrial spring alloy, has been announced by the Abrasives division of Elgin National Watch Co.

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Manufacturers and owners of grinding machines will both find many time-saving and profitable work holding ideas in this new 12-page book.
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Richard E. Krengel has been appointed general manager of Ex-Cell-O Corp. of Canada, Limited, of London, Ontario. Krengel leaves the position of manager of inter-plant production to assume his new duties. In his previous position with Ex-Cell-O Corp., Detroit, Mich., he co-ordinated work of the Canadian and American plants. Krengel joined the company in 1929 after graduating from Ohio Northern University with a degree in Mechanical Engineering. In his 28 years of service he has had extensive experience in manufacturing, engineering and sales.

Richard E. Krengel, Ex-Cell-O Corp.

Edward P. Gillane, Pratt & Whitney Co.

Edward P. Gillane, president of the Pratt & Whitney Co., West Hartford, Conn., and chairman of the board of Potter & Johnston Co., Pawtucket, R.I., has been named vice-president in charge of industrial operations for Penn-Texas Corp. He will continue as chief executive officer of Pratt & Whitney, a Penn-Texas subsidiary. **Gillane** first joined the organization in 1948, when he became vice president and controller of the Potter & Johnston subsidiary. He was made president and general manager of Potter & Johnston in 1955 and was elected president of Pratt & Whitney on November 1, 1956.

The Bonded Abrasives Division of **The Carborundum Company,** Niagara Falls, New York, has assigned six product managers to serve in liaison capacity between the manufacturing departments and the field sales force, according to an announcement by Mr. F. W. Scott, Jr., Sales Manager of the Division. The six managers are: **D. H. Currie, G. S. Eisaman, H. M. Newberry, J. W. Ripple, W. W. Barrett,** and **F. J. Miller.** The product managers, all abrasive engineers, will assist in the sale of assigned groups of commodities which are related to each other by manufacturing process and end use. They will also relay the needs of customers and salesmen to the research and development group and to manufacturing supervision.

Thomas E. Clagett is the newly appointed Detroit district sales engineer for Wickes machine tool division, Wickes Corp., Saginaw, Mich. Prior to his appointment, Clagett served in the division in both an engineering and sales capacity. He will cover the Detroit area from the company's Detroit office in the New Center Building. He holds the post formerly held by **J. A. Oeming,** currently sales manager of the machine tool division.

George W. Hoffmeister has been named general superintendent of Minneapolis-Honeywell Regulator Company's new plant at Fall River, Mass. The $300,000, 37,400 sq. ft. plant will produce a new line of electronics and controlling instruments for industrial use. It is being leased by M-H from a group of businessmen-stockholders who financed the plant's construction by popular subscription. Hoffmeister joined the company's Brown instruments division in Philadelphia in 1944 as a time study engineer. Prior to his recent appointment he was superintendent of assembly operations in Philadelphia.

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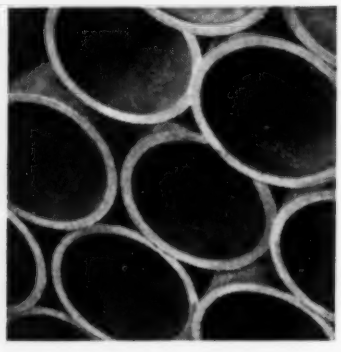
Abrasive Cutting Wheels

Abrasive Cutting Know-How

Know-How is just as vital to top performance in abrasive cutting as in any other machine tool operation

BETTER TUBING CUT-OFFS UP TO 14" DIAMETER



Pictured here is a close-up of part of a production run of tubing cut with an Allison Abrasive Cutting Wheel

NOTE—

- **Smooth, Burn-Free Cuts**
- **Absolute Minimum Burr**
- **No Distortion of Tubing**

• The fastest, lowest-cost, highest-quality cut-offs of almost any tubing material, *in sizes up to 14" diameter,* can be obtained by abrasive cutting...with absolute minimum of burr.

But such performance on your individual tube-cutting job is dependent on your use of the particular type and grade of abrasive wheel that provides the best balance for such inevitable variables as...available equipment...material to be cut ...cutting speed...desired quality of cut...and finally, wheel life.

The full line of Allison Wheels ...rubber or resinoid bonded for wet or dry cut...includes many wheels that are especially designed for Tube Cutting Service.

Allison Field Men...all of them Abrasive Cutting Specialists...have the specialized Know-How, and the wheels, to help you arrive at the best answers to your specific problems. Please ask for their help, without obligation.

Abrasive Cut-Off is the Ideal Method for tubing...tool rooms...job shops...high temperature alloys and tough titanium...heat-sensitive metals...solids up to 12" billets and many other jobs.

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James E. Kennerly has joined the Lea Manufacturing Co., Waterbury, Connecticut and is presently a member of the Laboratory Staff. Mr. Kennerly, a native of Camerton, North Carolina, attended High Point College and graduated from the University of North Carolina with a B.S. degree in Chemistry. He is a member of the American Chemical Society and the American Electroplaters' Society.

James E. Kennerly, Lea Mfg. Co.

Lloyd M. Price, Bay State Abrasive Products Co.

Lloyd M. Price has been appointed an abrasive engineer for the states of Minnesota, North Dakota and South Dakota for the Bay State Abrasive Products Co., Westboro, Mass. Prior to his appointment, Price was for several years associated with Morse Twist Drill. He has also been affiliated with the Armour Co., coated abrasive division. **John M. Mele** is now Philadelphia district manager. He will supervise Bay State's activities in the Philadelphia area, which includes: eastern Pennsylvania, southern New Jersey, Delaware, Washington, D.C., Maryland, and Virginia. Mele has been associated with the firm since 1951 as an abrasive engineer, first in the Ohio area and most recently in the New York City area.

Edwin R. Young has been appointed to the newly created position of employee counselor in Norton Company's personnel department. The creation of this new post will provide an additional service to Norton employees wishing information or guidance concerning questions about their jobs or personal matters on which the company may appropriately give advice. This appointment in no way alters Norton policy of long standing which urges any employee to discuss freely all problems with his immediate supervisor or any company officer—including the president. Rather it supplements the counseling services already provided through a man who will devote his entire time to helping others whenever needed.

Wencel A. Neumann, executive vice-president of the De Laval Separator Co., has assumed the responsibility of the company's industrial division sales and sales policies in addition to his previous responsibilities in the manufacturing, engineering and industrial relations divisions. Also named to new posts were **G. Frederick Wheelwright,** assistant to the executive vice-president; **Frank E. Lawatsch,** manager of industrial equipment application; **William C. Porch,** manager of industrial sales for the company's eastern district.

William J. Magee, former treasurer and director of Norton Company, died August 26 at the age of 68. Mr. Magee retired February 1, 1955 after a career of 25 years in various financial positions at the company. He was controller from 1934 to 1941, assistant treasurer until 1946 when he became treasurer and director. In addition, he served as treasurer of Norton Behr-Manning Overseas Inc., the company's overseas sales and manufacturing division, and Norton Company of Canada, Ltd., of Hamilton, Ontario.

Richard L. McKee, formerly staff assistant, industrial relations division, has been promoted to technical editor in the public relations branch of the Carborundum Co. McKee will administer the company's program of publicity in trade magazines, coordinating the preparation and publication of technical articles from all divisions and subsidiaries in the United States and Canada.

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TO AMAZING TOLERANCES
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Cut Your Inventory By Cutting Your Own Metal

Stock big sizes and cut it as you need it . . . that's the success story behind the Ty-Sa-Man saws that are paying big dividends to warehouses, fabricators and manufacturers from coast to coast. Best of all, when you cut it, in most cases, it's ready to use. The clean, square, accurate edges produced by this production saw need little or no machining or finishing work. This adds up to a saving of thousands of man hours, and just as important, saves the loss of waste metal.

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Harlan T. Pierpont, Norton Company

Henry G. Mogensen, Jr., Norton Company.

Frederick J. Rutland, Norton Company.

Frank J. Newman, Beckman Instruments, Inc.

Harlan T. Pierpont has been appointed manager of sales, electro-chemical division of Norton Company and also becomes a member of the operating board for this division. **Frederick J. Rutland** is now manager of sales engineering for the electro-chemical division. Pierpont was previously sales manager of the refractories division and Rutland sales engineer at Norton's Chippawa, Ontario plant. **Frank B. Huke,** formerly chief atomic products engineer, has been appointed manager of atomic product sales, refractories division. **George H. Powers,** formerly assistant sales manager of the refractories division, was promoted to manager of distribution for this division. **Henry G. Mogensen, Jr.,** has been appointed district sales engineer for the grinding machine division in the Detroit area. Mogensen joined the company in 1950 and has been a sales engineer in the Worcester sales office, grinding machine division, since 1952.

Frank J. Newman has been appointed marketing manager for the process instruments division, Beckman Instruments, Inc. He will be responsible for all sales and marketing activities. Headquartered at Fullerton, California, the division also operates research and manufacturing facilities in Stamford, Conn., and Ronceverte, W.Va. Assuming this new post after serving a year as sales manager for the division, Newman joined the company, in October 1955 as a product line supervisor. Prior to that time, he served as a sales engineer and as marine sales manager and product planner with Minneapolis-Honeywell Regulator Co.

Firth Sterling Inc. announces the promotion of **J. Martin Stokes** as assistant to the vice president, sales. Stokes was formerly manager, Carbide Sales Division. **Carl C. Krogh** has been promoted to manager, Carbide Sales Division.

Henry J. Fredericks, treasurer of Potter & Johnston Company of Pawtucket, Rhode Island, has been elected a director of the company. Potter & Johnston, a well-known manufacturer of automatic turret lathes, is a subsidiary of Pratt & Whitney Company of West Hartford.

Kirk Cousart and Associates, manufacturers representatives with home offices in Charlotte, N.C., have opened an office in Greensboro, N.C. **W. S. Mitchell** has been named manager of the new office, which will be located in the Waynick Bldg., 1882 Pembroke Rd. He formerly was manager of the firm's Durham, N.C., office.

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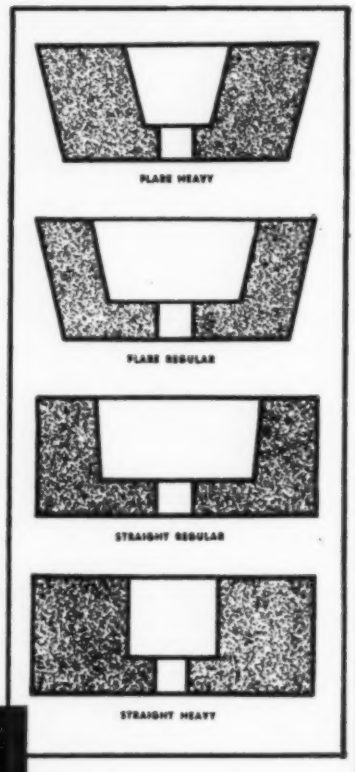
GRINDING WHEELS

A manufacturer of marine propellers raised finishing output 15% with the use of ATLANTIC "Job-Mated" GRINDING WHEELS. Closely-mated wheel characteristics with job requirements were credited as the main factors in making this increase possible. ATLANTIC representatives work on the basis that every grinding operation should be engineered for best results.

ATLANTIC Resinoid-Bonded CUP WHEELS are available in all popular shapes, sizes, grits and grades. Their wider lip design increases wheel life without sacrificing fast cutting qualities. Investigate their production possibilities. Consult your ATLANTIC ABRASIVE representative, or write direct to ATLANTIC ABRASIVE CORPORATION, 532 Pearl St., South Braintree 85, Mass.



For maximum safety, all ATLANTIC CUP WHEELS from 2½" up are speed-tested at a 50% higher speed than normally required.

ATLANTIC ABRASIVE CORP.

South Braintree 85, Massachusetts

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Joseph Buhler
Kraeuter and Co.

Wilbur L.
Kennicott
Kennametal Inc.

Joseph Buhler has been appointed national sales manager of Kraeuter and Co., Newark, N. J., manufacturer of hand tools. Buhler has been associated with Kraeuter for more than 12 years as a salesman.

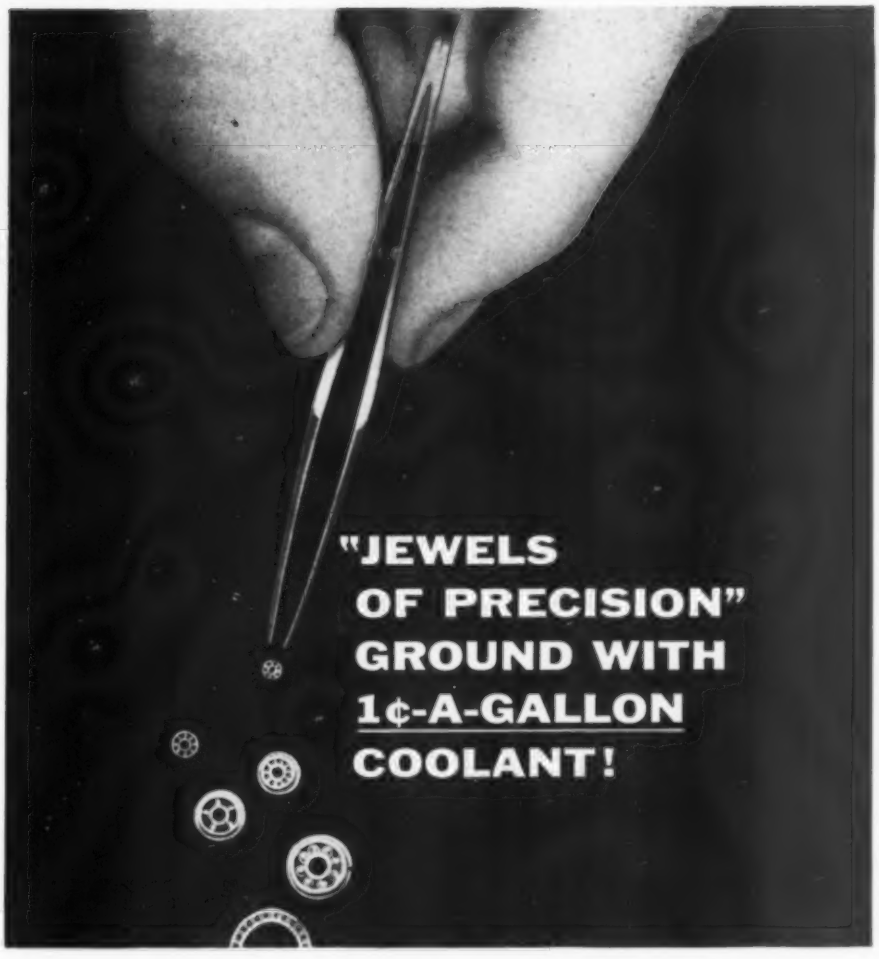
Wilbur L. Kennicott has been elected a vice-president of Kennametal Inc. After becoming associated with the company 18 years ago, a year after it was founded, Kennicott served three years as a sales representative in Texas and California. In 1941 he was assigned to the firm's headquarters in Latrobe and has since headed the company's engineering activities.

John H. Trecha has been appointed to the position of technical service engineer, research and development department, coated abrasives division, Armour and Co., Alliance, Ohio.

Trecha has been specializing in the field of abrasive engineering in the automotive industry.

Joseph W. Gallagher has been appointed manager of marketing of the special products division, Lord Mfg. Co., Erie, Penn. He will be responsible for all sales and marketing activities of the division, which is currently marketing uncured rubber-to-metal and rubber-to-tensile adhesives under the tradename Chemlok.

Election of **Dale V. Cropsey** as vice president in charge of industrial divisions for Elgin National Watch Co., Elgin, Ill., has been announced by J. G. Shennan, president. Cropsey's election follows his joining the firm last July as assistant to the president in charge of developing the industrial divisions. Formerly he was vice-president and director of sales for Potter & Brumfield, Inc., Princeton, Ind., relay manufacturers. His new responsibilities include supervision of both Electronics and Abrasives divisions of Elgin.



"We feel that White and Bagley 1500 is the best grinding liquid we have found!"

— Miniature Precision Bearings, Inc.

Machining of ball bearing assemblies so tiny that 500 can fit in a thimble is everyday routine at Miniature Precision Bearings, Inc., Keene, N. H. For such exacting work as precision grinding of tiny bearing races, W&B Grinding Concentrate 1500 is specified.

This entirely different type of coolant is normally diluted 1 part concentrate to 150 to 200 parts water. A 55-gallon drum of W&B 1500 provides up to 11,000 gallons of coolant — *at a cost of only 1¢ a gallon!*

Coolant made with W&B 1500 is transparent, and foamless as water. It provides excellent rust protection. Grinding is keener . . . machines stay cleaner. Chips settle almost instantly.

Mail the coupon for complete information about this outstanding coolant concentrate, being used by many of the country's largest manufacturers.

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Originators of Grinding Lubricants

THE WHITE & BAGLEY CO., 88 Foster St., Worcester, Mass.
Please send me complete information on W&B Grinding Concentrate 1500.

NAME..... TITLE.....
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CITY..... ZONE..... STATE.....

☐ My plant has a tricky grinding problem on which we'd like advice. I've attached a letter describing it in detail. I understand that you offer this service without obligation.

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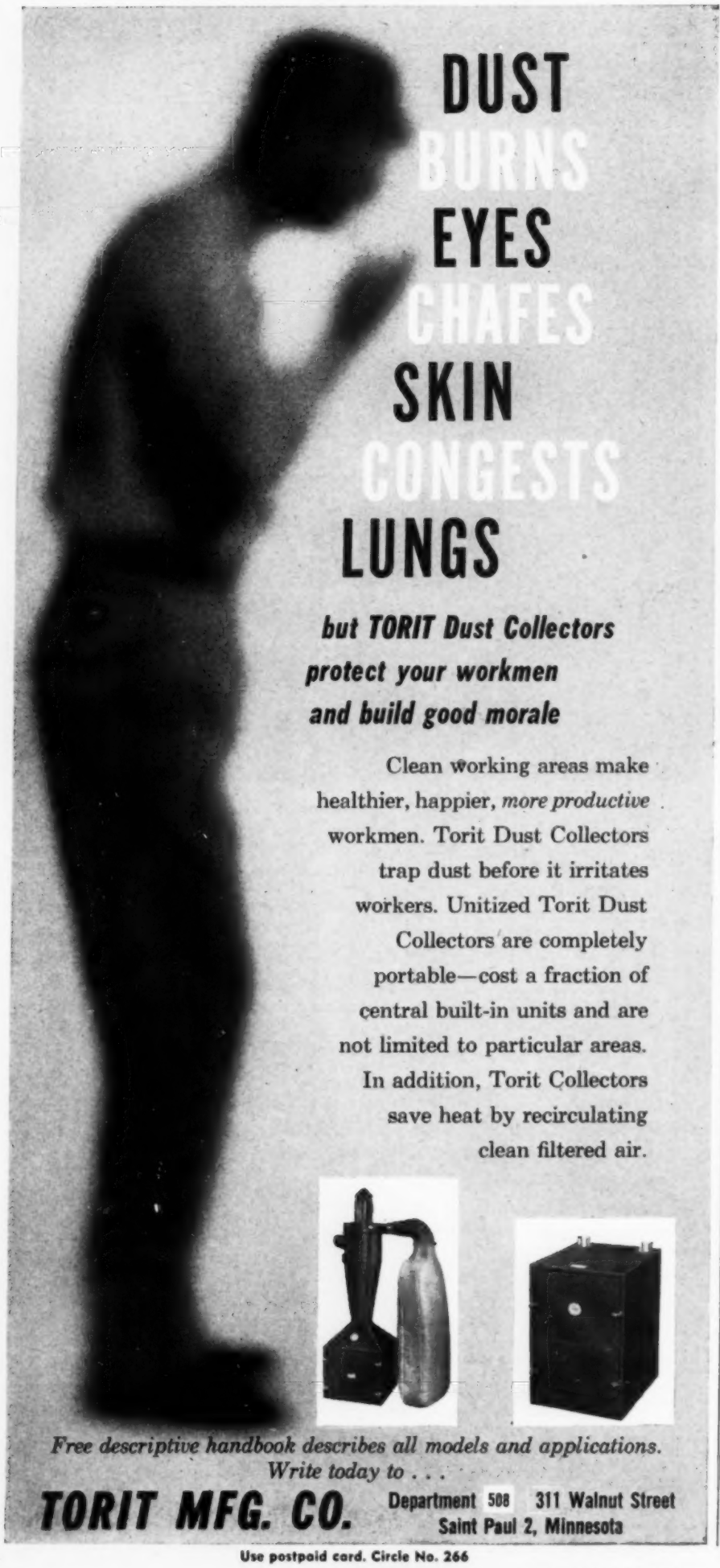

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Jay E. Watson, chief of the Ordnance Gage Center at Frankford Arsenal since 1952, has become chief engineer—conventional gages of the Pratt & Whitney Company's gage division. Watson was in charge of designing gages, fixtures and test equipment used in final inspection of rockets, grenades and jet propulsion units during World War II. Later, after a brief period of industrial designing, he became chief of the standards and procedures branch of the Ordnance Gage Center. He represented the Department of the Army as a delegate to the American, British and Canadian Conference on Unification of Engineering Standards in April 1955. Earlier he had been an Ordnance Corps liaison representative to the Naval Tripartite Engineering Standards Conference in Washington, D.C.

George F. Burditt
Wheelabrator Corp.

Francis E. Noyes
Wheelabrator Corp.

George F. Burditt, formerly district manager of the Wheelabrator Corp., Pittsburgh sales territory, is now manager of the Steel Mill Equipment Sales Div. at the headquarters in Mishawaka, Ind. **Joseph F. Underway** from the St. Louis office has been transferred to the Pittsburgh territory to replace Burditt. **John B. Booth** is the new sales engineer in the Los Angeles sales office. **Francis E. Noyes** has been advanced to district manager of the St. Louis sales territory. **Wayne L. Hungate,** who joined the corporation in April, 1957, has been assigned to the St. Louis territory as a sales and service engineer. **William A. Illsley,** formerly of the Detroit territory, has been transferred to the Cincinnati territory as district manager. **William E. Scherrer,** also new with the company this year, has been appointed sales engineer of the Cincinnati territory.

Joseph A. Boothroyd, Jr. of Ridley Park, Pa., has been appointed sales representative of the Size Control Company, Chicago, Illinois. Mr. Boothroyd will service the area of Philadelphia and be associated with the George S. Maier Company with offices at 500 Crum Lynne Road, Ridley Park, Pa., according to Size Control general sales manager, E. E. Olds. Mr. Boothroyd

has been associated with the metal working field in an engineering capacity for over ten years. He has been directly associated with the area he serves for the past nine years.

James Fatula has been appointed vice president-engineering of Ryman Engineering Company, manufacturers of Abrasive Belt Grinding Equipment in Ellwood City, Pa. Mr. Fatula joined the firm in October 1952, as assistant chief engineer, coming from Mesta Machine Company. Earlier this year he was made Chief Engineer. He is a graduate of both the Mechanical Engineering and the Industrial Management Schools of Carnegie Institute of Technology.

The appointment of **Alvin J. Jones** as Director of Engineering of the Motch and Merryweather Machinery Company was announced by Richard W. Banfield, President. Mr. Jones comes to Motch and Merryweather with 21 years experience in the machine tool field. He holds a BS degree in Mechanical Engineering from Missouri School of Mines and at various times during his career has been a serviceman, sales engineer and designer of special machine tools. His last position was that of Chief Engineer with the Landis Tool Company, Waynesboro, Pennsylvania. In his new position, Mr. Jones will direct all engineering activities at Cleveland as well as at the Avey Division in Cincinnati.

Developing Technical Manpower To Be Discussed

"New Concepts in the Education and Development of Technical Manpower" is the theme of the 1958 College-Industry Conference of the American Society for Engineering Education which is to be held at the University of Michigan January 30 and 31.

Four speakers are scheduled to present the new concepts arising from current research: Paul Reinert, President of St. Louis University, will speak on "New Concepts in Education from the President's Committee on Education Beyond High School"; Andrew A. Kucher, vice president of Engineering and Research for the Ford Motor Company, will have "New Concepts in Engineering" as his topic; Donald C. Pelz, University of Michigan Survey Research Center. "New Concepts Useful in Motivating Engineering and Technical Personnel"; Lee Danielson or John W. Riegel, U-M Bureau of Industrial Relations, "New Management Concepts Obtained Through Interviews with Employed Engineers and Technicians."

Four additional speakers will describe new programs designed by their companies to utilize New Concepts of Professional Development: W. R. Collings, President of Dow-Corning Corporation; E. E. Sivacek, Chief Engineer, King-Seeley Corporation; A. L. Bain, Superintendent of Engineering Training for Western Electric Company; L. V. French, Director of Engineering Personnel for Whirlpool-Seeger Corporation. These reports hold many implications for education as well as for employers of engineers. Several other features are in the process of being arranged.

Registration will be held from 8:30 to 10:00 A.M., January 30. Those attending will be welcomed by William Stirton, vice president of the University of Michigan. The conference will adjourn at 2:00 P.M. Friday, January 31.

For additional information contact the University of Michigan College of Engineering, 255 West Engineering Building, Telephone NOrmandy 3-1511, Extension 2655.

Norton Expands Plant

Norton Company has already begun construction of an addition to its Cap-de-la-Madeleine, Quebec, silicon carbide processing plant which will increase the output capacity of the plant by 25 to 40%.

The Cap-de-la-Madeleine plant was purchased by Norton in 1949 and the first silicon carbide was produced there in 1951. The plant was acquired to provide needed increased facilities for electric furnace operations outside the Niagara Falls area. Plentiful electrical

to do small grinding jobs

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FAST...

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SANFORD

Model SG

SURFACE GRINDER

This unrivalled small parts grinder can be depended upon for micro accuracy. It's easy to use too . . . every hand wheel and operating switch is at your finger tips.

Designed and built by engineers and tool makers of rare foresight for tool, die and gage work, it has been constantly preferred after these many years of proven worth.

Write for fully illustrated literature, replacement parts and special attachments data with price list.

For WET or DRY grinding, specify optional equipment.

PARTIAL SPECIFICATIONS—

Chuck Surface—3"x5" or 4"x6".
Table travel—8", traverse 4".
Vertical head movement—6".
Work area under 4" wheel—6", with chuck—4".
Standard grinding wheel—4" x 3/8" x 1/2".
Spindle speed—approx. 5500 RPM.
Motor, 1/6 HP, single or 3 ph., dynamically balanced.
Dimensions—23"x30"x27" high.
Net wt. approx. 160 lbs.

Representatives in major industrial areas

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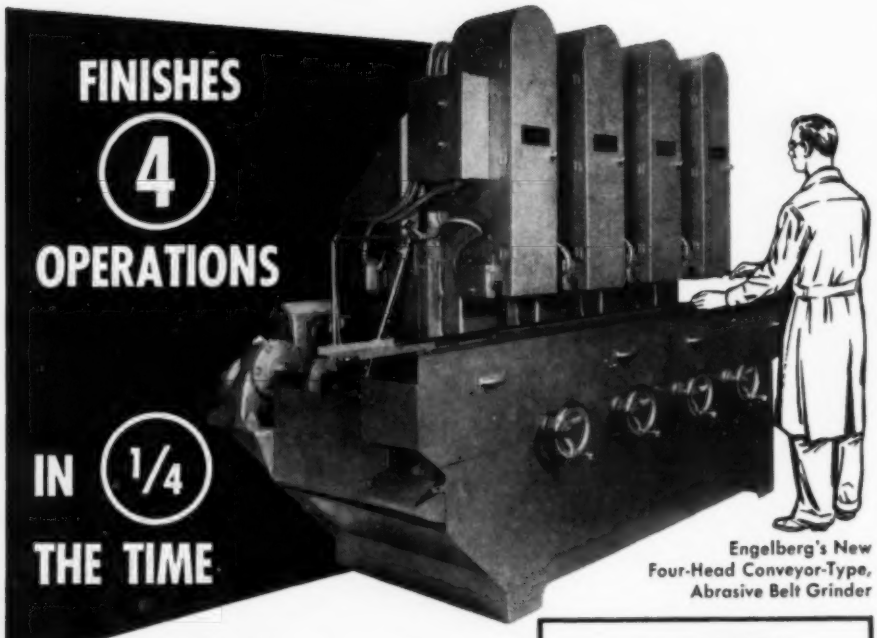


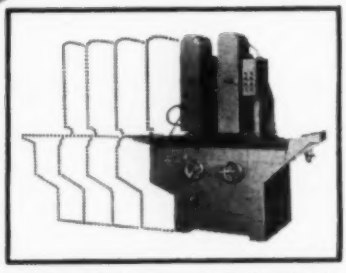
Engelberg's New Four-Head Conveyor-Type, Abrasive Belt Grinder

Surface, size, Semi-finish, Fine Polish . . . in ONE Pass!

Talk about high speed production. You will — when you see Engelberg's new multi-head conveyor-type abrasive belt grinder precision size and fine finish *any* ferrous, non-ferrous, plastic or other flat surface. *With one machine — one operator — and one pass* — you can now complete *four* different grinding and polishing operations.

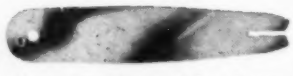
Think of the costs you can slash on high-volume runs. Think of the time you can save on set-ups and changeover. And the initial cost is far less than you'd have to pay for separate machines.

SEND SAMPLE PART TODAY for cost-and-time-savings estimate. Or if more convenient, an Engelberg Production Engineer will be glad to discuss your grinding problems. No charge — no obligation, of course.



Choice of 1 through 6 grinding heads with 6", 8", 10" or 12" belt width.

Parts Finished in ONE Pass

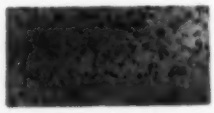


Chain Saw Bars — 4 head operation removing .004" per head for total .016" per pass with conveyor belt speed of 6' per min.

Roger Dean FORD

Name Plate — 3 head operation using #240, #320 and #500 grit abrasive belts with conveyor belt speed of 14' per min.

Skate Blades — 5 head operation using #120, #180, #240, #320 and #500 grit abrasive belts at 12' per min. conveyor belt speed.



Rubber Tile — 3 head operation using #240, #400 and #600 grit abrasive belts with conveyor belt speed of 21' per min.

ENGELBERG
HULLER CO., INC.
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power in the Three Rivers, Quebec, area was an important factor in the decision to locate there.

Howard J. Daly, Vice President and General Manager of Norton's Electro-Chemical Division, reports that the new facilities should be in operation by the end of the year.

Quality of American Education Declining, Researcher Asserts

BIRMINGHAM, ALA.—"Our educational effort today is still in approximately the same position as was the military effort of this country before Pearl Harbor," a prominent southern scientist-business man told Alabama school administrators here recently.

Dr. Frank J. Soday, vice president and director of the Chemstrand Corporation's Research and Development Division and chairman of the Southern Association of Science and Industry spoke at a work conference of the Alabama Association of School Administrators.

"We will have to do in the educational field what we have done in the military establishment during the past 15 years, adopt new concepts, techniques, and procedures."

It will be necessary, Dr. Soday told the educators, "to make a breakthrough to a radically higher and broader conception of what is needed and what can be done."

The problem of education is particularly acute here in the South, Dr. Soday said. "The rapid rate of industrialization, the swift transition from a rural to an urban economy, and the increasing proportion of technical and professional workers in the labor force all indicate that the South is well on its way to becoming the most important productive area in the country.

"We are entering upon an era which will tax to the utmost the capacity of the people in this region to cope with the greatest problem of our time—the growing deficit in the quality and quantity of American education."

Although college enrollments are growing, Dr. Soday said, "in the South, less than half of the high school graduates having an I.Q. above 130 (PhD level) graduate from college."

In addition to the annual eight billion dollar monetary loss which this represents for the South, he said, our area "is providing a completely inadequate supply of scientists and engineers to supply the minimum industrial needs of the area. With 25 per cent of the industry of the country, the South's schools supply only 17 per cent of the country's scientific and engineering graduates."

Dr. Soday said "Russia already has an army of over five million specialists

and will increase this to 10 million by 1960. They will then far outnumber those of the United States which is already suffering from a shortage of scientists. In addition, the production of scientists in Russia is increasing each year, while the number of science graduates in this country is steadily declining."

In Russia, Dr. Soday said, six per cent of the entire national budget is devoted to education while the United States is using only two per cent. "Today Russia has 50 per cent more students enrolled in schools and colleges than are enrolled in this country."

Dr. Soday termed this trend towards Russian scientific superiority "the most serious challenge facing the free world today, and our survival as a nation will depend upon our ability to meet this challenge. Our only hope of success lies in a tremendous increase in the rate of production of scientists and engineers."

Entire Plant Must Be Geared to Automation

Automation, of necessity, will be used increasingly to meet a relative decline in the labor force and a larger national output.

This was the prediction made in Chicago by Dr. John T. Rettaliata, president of Illinois Institute of Technology, at the Midwest Conference on Quality Control at the Hotel Sherman.

Speaking on "Quality in an Automated Economy," Rettaliata said that automation can lower production costs by increasing productivity of the individual worker and by better control of production and business.

"Automation can, and almost always does, yield a better quality of manufactured product or processed item," he noted.

"The combination of these characteristics leads to a more favorable relationship between quality and costs from the consumer's standpoint, which improves profit and, at the same time, advances the standard of living."

To be entirely effective, however, the Illinois Tech president said that the entire plant—from raw material to consumer—must be geared to automation.

"The huge investment in an automated production line requires that all phases of the business—raw material procurement, manufacture, warehousing, sales, and distribution—be scheduled for the most effective and economic use of the production facility."

At the same time, these goals can be acquired only through top management understanding and program coordination, Rettaliata said.

New problems that management must cope with include plant communications, proper employee education and training, long-range planning, and revised cost elements and job descriptions.

Scientists and engineers will be called upon to conceive and develop the tools industry will need to produce the things necessary for the satisfaction of the public's ever-increasing demand for better living, he stated.

To meet this need, Rettaliata predicted a change in emphasis in engineering education.

It will not be too long before a graduate degree will be the minimum requirement in engineering, in order to better prepare engineers for their leadership role in the industrial economy, he said.

Industry has a reciprocal responsibility to help in the task of education, he added.

If the demand for more and finer engineers is to be met, there is an urgent need for greater effort to reach into the high schools and bring engineering as a career to the attention of American youth.

Rettaliata charged the industrial representatives to intensify efforts to interest more young men and women in the profession, to give them compelling motivations for entering the field.

"A major effort must be made to bridge the gap between high school and college, to eliminate or reduce the tragic loss of potential scientific and engineering talent which is not developed by formal education at the higher level," he said. •

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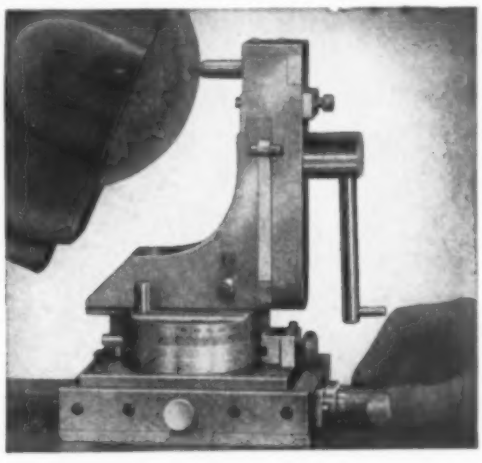

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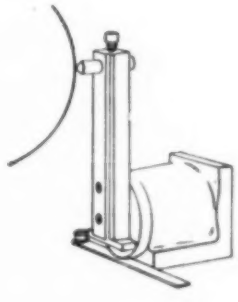

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Sending Space Messages Studied by Lockheed

SUNNYVALE, CALIF.—Sending of radio and radar signals across the vast reaches of outer space is being studied by Lockheed Missile Systems division scientists in a large, new space communications laboratory opened recently.

More than 50 Lockheed scientists, engineers and electronic experts occupied the facility where they will continue exploring the problems of sending and receiving space messages and identifying objects far from earth.

Studies underway at the laboratory—the most complete of its kind in the country—might well pave the way for communication with manned space ships of the future or for the remote guidance of unmanned space ships, said Emanuel A. Blasi, head of the missile division's antenna and propagation department.

Blasi, who is in charge of the laboratory operation, said areas to be covered include:

- The effect of outer space's cosmic rays on radar and radio signals.
- The radar pattern presented by various space vehicle and missile shapes.
- The effect of the ionosphere—the electrically charged space beyond the earth's atmosphere—on such signals.
- The characteristics of various antennas when installed in missiles.

The three story, 10,000-square-foot laboratory, Blasi said, can recreate space conditions as they exist many hundreds of miles above the earth.

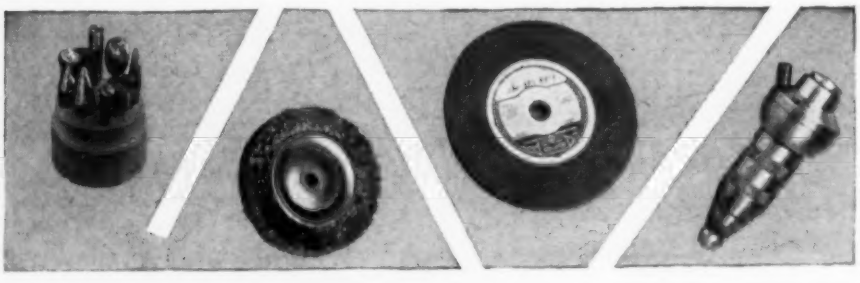
An anechoic chamber—or "quiet room" measuring 20 by 70 feet—produces electronic conditions to be found 300 miles in space by eliminating all stray electronic signals.

Much of the advanced research being done is in connection with the Navy's Polaris ballistic missile on which Lockheed's missile division is the missile system manager, said Blasi.

He said that an important part of the investigations cover antenna design and installation. Whether on a missile or space ship, he explained, an antenna will send messages of varying strength depending on its angle to the receiving antenna. Space communication depends on how well the antenna transmits in different positions when installed in a vehicle, he declared.

To further these critical studies, the new Lockheed facility has four instrumented antenna and reflectivity ranges with four sets of tracks extending up to 500 feet. Small antennas installed in model missiles are mounted on non-reflecting pylons. Motorized carriages of the pylons—remotely handled from control rooms—carry the models to various distances along the eight-foot tracks for the tests.

Because of the intense interest and research in space communications, Blasi said, the Lockheed facility will be made available to other scientific groups on a commercial basis. •



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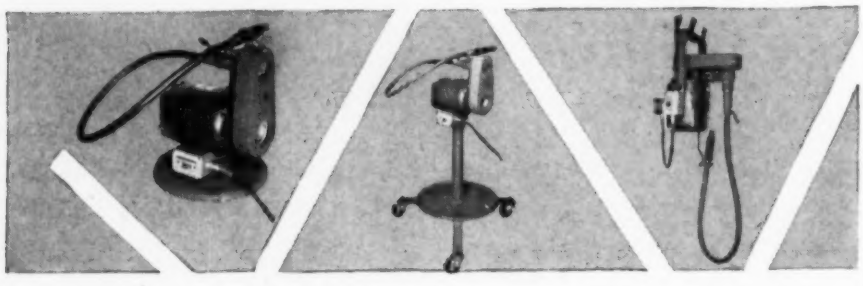

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Edsel Proves Stainless Steel Is Here To Stay!

The Edsel, proud addition to the Ford Motor Company's "family of fine cars," provides still further evidence of the indisputable role of stainless steel in the automobile of today— and tomorrow, according to Richard E. Paret of the Committee of Stainless Steel Producers, American Iron and Steel Institute.

"The widely publicized story of the years of planning that went into the Edsel," Mr. Paret says, "establishes the fact that the designers and engineers were completely free to experiment with new methods, new forms and new materials. They were not bound by custom or tradition, and were actually encouraged to test the performance of all materials seeking a new or greater role in the automobile industry."

Even a cursory look at any Edsel model, he points out, shows that stainless steel emerged once again as the material of choice for bridgework." The Edsel gleams with more stainless steel trim than virtually any other car model in its class—an average of 36 pounds of lifetime beauty, strength and durability," Mr. Paret estimates.

The sweeping side scallops, for example, which are among the Edsel's many distinctive features, are high-

lighted and protected with accent mouldings of indestructible stainless steel, he reveals. Along with "all other critical points of wear," the forward body mouldings are also stainless steel. These particular mouldings are among the most functional parts of the car's exterior since they extend across the front doors to protect the finish from scratches and dents.

In addition, rocker panel mouldings, roof drip-rail mouldings, rear window mouldings, windshield mouldings and windshield wipers are all of stainless steel. Along with just about all other American cars, the Edsel also features stainless steel wheel covers.

The Ford Motor Company pioneered the first automotive use of stainless steel in 1930 on the Ford Model A. Since that time, Ford products have made extensive use of this exceptional metal which not only resists corrosion, but offers extremely high strength and resistance to scratching. It is one of the strongest known materials and for this reason is used extensively in rail car construction and in new jet fighters and bombers, where its very high strength reduces weight—even beyond that obtainable with "light" metals.

Maintenance for stainless steel is simple—all it needs is an occasional washing with soap and water, but any car cleaner can be used.

Raterman Addresses Machine Tool Builders

FRENCH LICK, IND.—Total machine tool shipments for 1957 will be at least $800,000,000, Jerome A. Raterman, President, National Machine Tool Builders' Association and Chairman of the Board and President of The Monarch Machine Tool Company, Sidney, Ohio, told members of the Association at its 56th Annual Meeting, October 23.

"I would call this a very substantial volume," Raterman said. "This figure has been exceeded in only four of the last thirteen years."

As to new orders, Raterman said, it is a far different story. Net new orders for the third quarter of 1957 have averaged $43,000,000 per month.

"If this average should be maintained in the future," Raterman said, "it would indicate an annual volume of about $516,000,000 per year. Before we start singing the blues at any such prospect, let's go back and make a few comparisons.

"During the peace-time years, 1946 to 1950, and 1955 and 1956—seven years during which the industry had practically no carry-over from defense emergencies—our production averaged $434,000,000 a year, an amount considerably below what we can expect today, if new orders continue at the present rate."

Raterman cited three reasons for looking toward the future with confidence:

1. Figures on age and obsolescence of machine tools now on plant floors indicate an enormous potential replacement market;

2. Beyond this market lies future demand for machine tools for plant expansion projects delayed, but not abandoned;

3. Rate of research and product development within the machine tool industry.

Attending the meeting are over 300 executives of machine tool companies representing about 90% of the country's machine tool production capacity.

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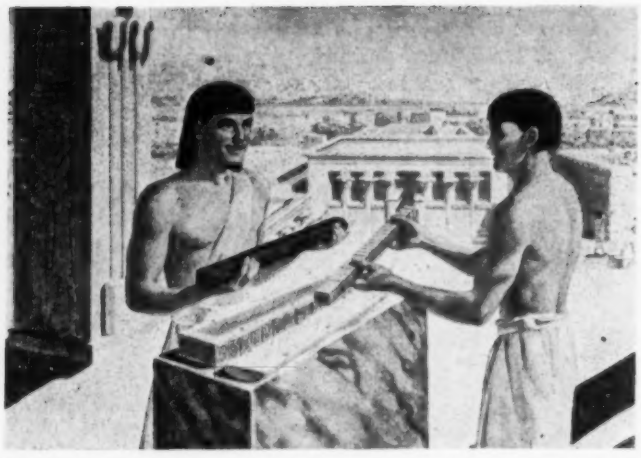

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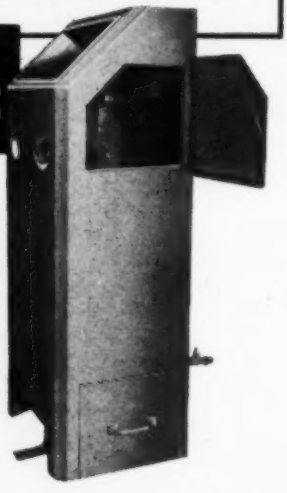

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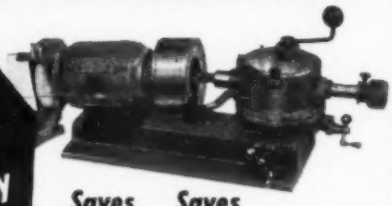

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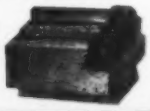

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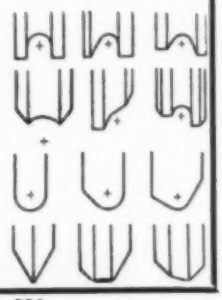

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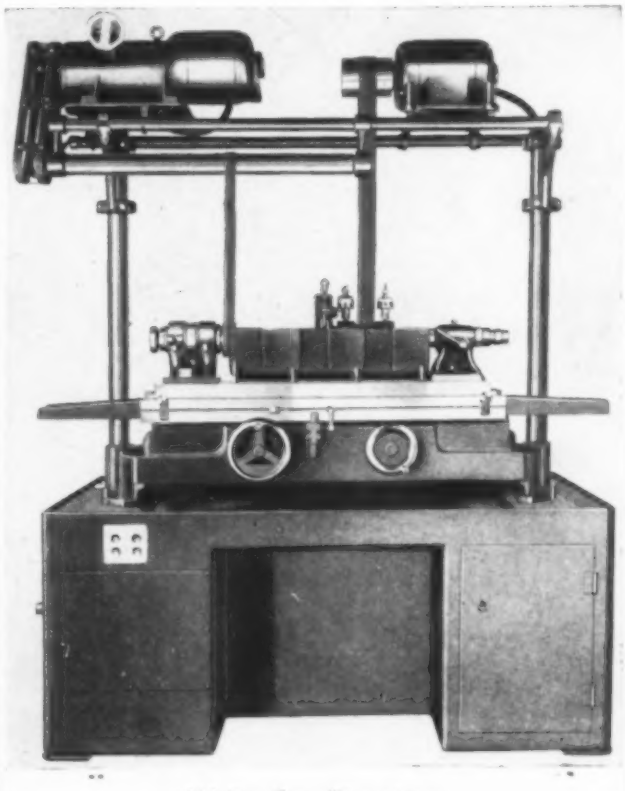

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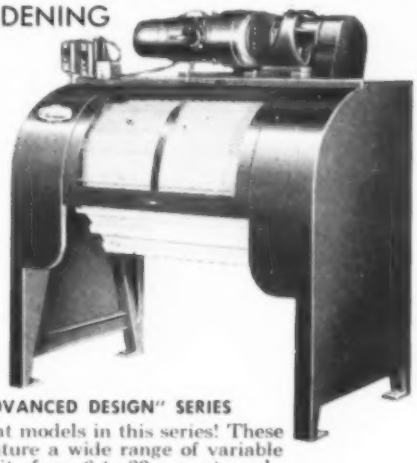
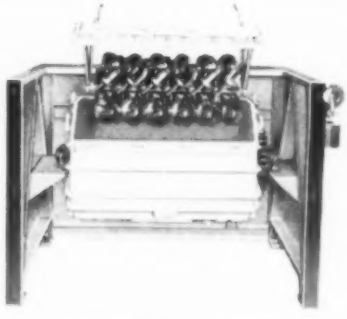


ALMCO'S "ADVANCED DESIGN" SERIES

Thirteen great models in this series! These machines feature a wide range of variable speeds (infinite from 6 to 30 r.p.m.), making possible economical deburring and finishing of the greatest variety of parts. Each unit has Almco's exclusive design features and rugged construction to stand up under all types of punishing applications.

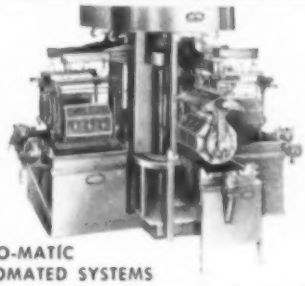


"FIXTURE" TYPE BARRELS

Pioneered by Almco for processing large and intricate parts. Custom designed fixtures hold parts securely, prevent part-on-part impingement and allow abrasive action to reach all surfaces, cavities, slots, etc. Barrels have automatic forward and reverse controls. Almco also offers integrated materials handling systems for further barrel finishing economies.

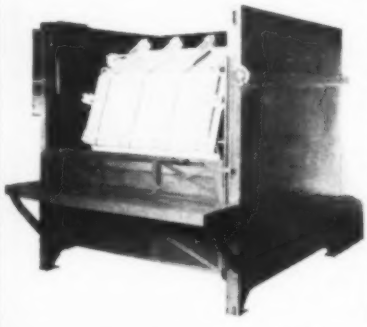
MULTI-COMPARTMENT BARRELS

Do you have these deburring and finishing problems — wide variety of parts or small quantity runs where fixtures would be too costly? Or short to medium cycle runs where you could *re use* compound for several runs? Lack of floor space for several machines? An Almco custom-designed multi-compartment barrel may give you a cost-saving answer. Automatic forward and reverse. Any combination of compartments and doors.



SUB-O-MATIC AUTOMATED SYSTEMS

Almco's exclusive submerged unit is an automatic "assembly line" system for micro-precision deburring and finishing of small parts in quantity. Saves labor, speeds up processing and flow of high production parts. One man for example can operate this equipment and handle as many as 192 barrel loads per 16 hr. day. Slashes compound expense to minimum because compounds can be re-used for days at a time. These submerged systems can also be obtained in non-automated, straight line systems.

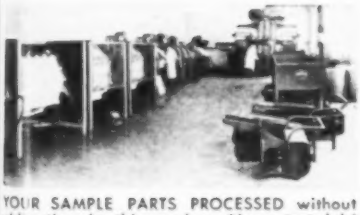


CUSTOM-DESIGNED BARRELS

Almco designs and manufactures special barrels of all types for problems where standard equipment cannot be effectively used. These range from the smallest type to the largest fixture barrel such as the 60" diameter x 60" length barrel shown above. Special large diameter barrels with double flat or triple flat doors are also available to accommodate extra large parts and to allow abrasive media to flow freely over the outer periphery of the part. Your special problems may be solved with one of Almco's custom-designed barrels. Material handling systems can also be closely coordinated with special barrels.

SMALLER MACHINES

Twin barrel machines manufactured by Almco are the standard of the industry for shops processing small lots of parts and for companies with large lots of small parts. Also ideal for sample processing, barrel finishing research and development work, and as auxiliary equipment. These units are Almco engineered to the highest specification standards and include operational and safety features found on larger Almco machines.



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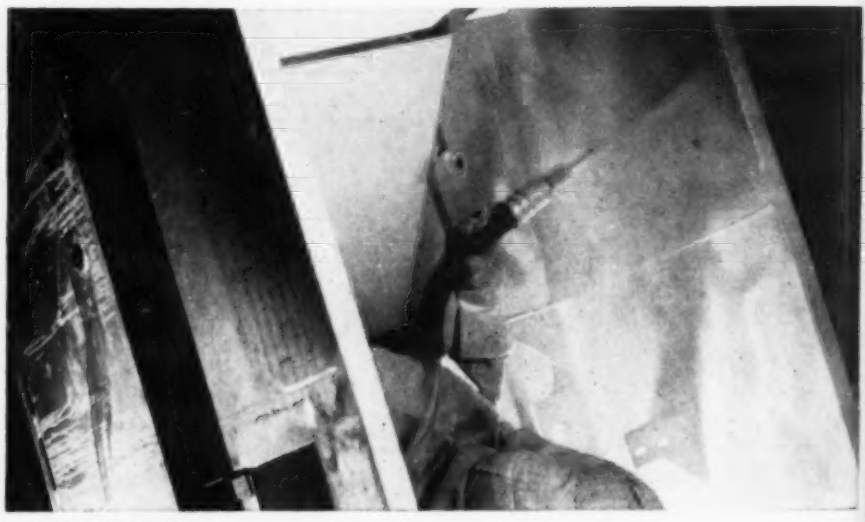

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